



**Annual Report**  
of  
**Research and Experimental**  
**Work**

of the  
**Department of Agriculture**  
**H.E.H. the Nizam's Government**  
for the year

**1342—1343 Fasli**

(6th June 1933 to 5th June 1934)



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## FOREWORD

This report gives in detail an account of research and experimental work carried out by the various sections of the Agricultural Department of H.E.H. the Nizam's Government, during the year ending 31st of Tir 1343 Fasli (5th of June 1934 A.D.). The work has not advanced far enough to draw any final conclusions, but a summary of the results obtained during the year is given below.

2. The Botanical section is working on plant breeding on rice, castor, jowar and wheat. The work on rice has begun to give definite results. Two strains evolved by the section, *viz.*, Himayatsagar Nos. 263 and 504 have been successfully demonstrated in villages, and are becoming popular with the cultivators. The section has got 16 other strains of early ripening rices and a large number of late ripening rices, which are promising. In the castor breeding work, though the various strains selected so far are not quite pure yet, half a dozen of them have proved distinctly superior in yielding capacity and oil content.

3. The chemical section was mostly busy with analyses of the juice of sugar-cane variety Coimbatore No. 213, with the object to find out the most suitable time for harvesting and crushing the cane. The results show that the most suitable time from the point of view of manufacture of sugar would be from about the second week of December to about the fourth week of March. The analysis continued till late in the season gave very interesting results, in that it showed that the crop could be kept standing in the field till about the end of May without fear of deterioration in its sucrose content. Analysis of gur manufactured from Coimbatore 213 obtained from different parts of the State was carried out to investigate the cause of the alleged salinity in it. The results show that salinity is due to the soil and not to the cane itself.

4. The Entomological section has not been able to do any systematic research work as yet. The small staff

has mostly been busy with large scale campaigns against Red Hairy Caterpillar and Castor Semi-looper in the villages. The campaign is successful.

5. On the Animal Husbandry side, the Poultry Farm has begun to give some results. Of the various breeds of fowls under trial, the Rhode Island Reds seem to be the most hardy.

6. The plantations of the Horticultural section are too young to give any results of value. However, the Basrai variety of plantain and Washington and Gujrat varieties of Papaya have proved successful and are in demand now. The Phulwa variety of potato has also proved useful, in that it can easily be kept without rotting for sowing in the next season.

7. Of the various kinds of experiments in progress at the Himayatsagar, Sangareddi, Rudrur and Mahbubnagar farms of the Telingana Division, the following have given the results mentioned below:—

(a) The manurial experiments with rice have shown that the chief thing required for growing a good crop is Nitrogen, and that Nicifos is on the whole better than a combination of Ammonium Sulphate and Superphosphate.

(b) A rotation experiment is in progress with a view to see if it is possible to replace the Rabi crop of rice with some other Rabi crop, so as to avoid growing of rice continuously in the same field season after season, and to overcome the difficulty of shortage of water for irrigation of rice, which frequently occurs in Rabi season. The results of the experiment show that of the various crops under trial Onions is the most profitable crop to be grown in place of rice.

(c) Of the various varieties of different crops under trial in sugar-cane, Coimbatore 213 has continued to prove the most successful. Coimbatore 290 and P.O.J. 2878 have also given very good results. In ground-nuts, Kanke 17 has continued to do the best, while Hebbal No. 1 and Spanish pea-nut have also given good outturns. In Bajra varieties, the Cawnpore Awned has continued to give the best results. The experiment of cultivation of cotton in coarse sandy soil in the Kharif season has given very interesting results. The outturns have been quite satisfactory. It may become possible to

introduce this new crop in the large areas of that kind of soil in the Telingana.

(d) Some Government land in the Nizamabad district has been resigned by the cultivators and is lying waste. It possesses deep black cotton soil, and the cultivators think that it is unfit for growing irrigated crops. An experiment was started with various kinds of crops. Rice and sugar-cane gave satisfactory outturns.

8. Of the experiments in progress at the Main Experimental Farm of the Godavari Division at Parbhani, the following have given the results mentioned below:—

(a) The experiment to see whether green manuring with the Sunn Hemp will help the unirrigated wheat crop in giving better outturns, gave results in favour of green manuring.

(b) The results of the seed rate experiment with ground-nuts are in favour of 40 lbs. of seed per acre.

(c) A number of different strains of long-stapled cotton of the Gaorani type evolved by the Cotton Research Botanist were compared with the local Gaorani Umri. Three of the strains gave higher yield than the local, and are better in staple length and ginning percentage. Similarly, an experiment was carried out with a number of better varieties of cotton to find out a pure variety for the short stapled area of the division. Of these Havri No. 3 gave the highest yield. It is also better in staple and ginning percentage than the local mixed variety. Of the various varieties of ground-nuts that were tried, Small Japan gave the highest outturn, with Spanish pea-nut standing the second. In sugar-cane, of the various varieties which were tried, Coimbatore 213 gave the highest yield of Gur.

9. Lay-out, levelling and equipment of the two new main farms, one at Raichur for the Karnatik Division and the other at Warangal for the East Telingana Division, is nearly complete. General crops for multiplication of seed and production of fodder were grown during this year. Experiments will be started when the soil has recovered from the disturbance caused to it in scraping and levelling.

10. The Administration Report of the Department is published separately. Those interested in the activities of the department in general are advised to refer to the same.

(Sd.) NIZAMUDDEEN HYDER,  
*Offg. Director of Agriculture,*  
*H.E.H. the Nizam's Government.*

*Annual Report of the Economic Botanist to H.E.H. the Nizam's Government, for the year 1342-43 Fashi.*

### ADMINISTRATION

Mr. R. K. Bhide remained in charge of the section as Economic Botanist to Government till Ardibehisht 31, 1343 F., when he retired, handing over to the undersigned. The undersigned remained in charge of the section from that date till the end of the year, as Economic Botanist, appointed in place of Mr. Bhide.

The work of the section consists in improvement of four important crops of the State, *viz.*, rice, castor, wheat and jowar. The writer continued to remain in charge of the castor improvement work at the Main Experimental Farm, Himayatsagar. Mr. Nanjundaiya continued to work on rice at the same farm under the control of the Botanist. Mr. Gideon continued to work on jowar and Mr. Powar continued to work on wheat, at the Main Experimental Farm, Parbhani, under the control of the Botanist.

The Economic Botanist is also responsible for the control of the Entomological section of the Department. Mr. Venkat Krishnan, Entomological Assistant, continued to do that work under the general supervision of the Botanist.

### PADDY IMPROVEMENT.

*Abi Season.*—The area was manured with compost at the rate of 16 tons per acre. The stuff was evenly spread over each plot, which had been previously divided into four equal parts. The nursery was sown on Amerdad 4, and 5, 1343 F. by planting in the puddle brown paper sheets measuring 14"  $\times$  14" with 144 seeds of a single strain previously glued on to each sheet. Fine silt was then thinly spread over the sheets. There was good germination by Amerdad 10, but a set-back occurred by Amerdad 16, in the shape of a severe attack of *Hispa armigera*, which was checked by spraying the seedlings with Arsokol. All leaves, affected with the grub were removed, when transplanting.

The transplanting was done from Amerdad 30, to Shehrewar 1, 1343 F. in unmanured plots, which had been previously well ploughed and puddled. The seedlings revived in a month. The *abi* work contains two portions, one having early samples and the other late. Hence, two standards were used. Strain No. 263 for the earlies and strain No. K 42 in the late ones.

During the early part of the season, that is, about twenty days after transplanting, a severe attack of Hispa broke out and the affected leaves were removed by hand. There was also a general borer attack and its incidence is shown in Table VII (a) and VII (b) attached. An unidentified disease, causing many weak tillers to sprout, appeared in the late strains, especially K 42 and No. 80. This reduced greatly the number of well-developed heads on the plants. The strain to flower earliest was No. 174 (Mehir 2, 1342 F.) and the harvesting began on Azoor 4, 1343 F.

Of the early strains tested against No. 263 four, namely, Nos. 502, 503, 539 and 541 appear to be somewhat better than the standard No. 263. Strain No. 483 and No. 69 are almost equal to No. 263. Fifteen strains are about 10 per cent. less in yield than No. 263, while forty-six strains are 10 to 20 per cent. less. Tables I and II contain these results.

Among the late strains that were sown 121 of them have proved to be better than the standard K 42. The superiority ranges from 1 to 55 per cent., when No. 179, 169 and 167 are not considered. These three, however, are found this season to be 76 to 95 per cent. better than K 42. These results are shown in Tables III and IV.

Strains Nos. 161, 242, 273, 370, 504, 505 and 539 were tried out with No. 263 as the standard. The results based on the percentages are shown in Table II. From these figures we see that only strain No. 539 has out-yielded 263 by a small margin (4.6 per cent.). Another thing that is worth noting is that No. 263 is very decidedly superior to No. 504 in yielding ability. In fact the difference is remarkable, being actually 34.5 per cent. No. 504 is the strain that we have been disseminating among the *raiyyets*, who have preferred it to No. 263 because of its superior (finer) grain. However, where coarse rice is so generally grown and eaten as in the

villages of the Telingana, it seems that there should be sufficient scope for a rice like No. 263 with such outstanding yielding ability. Round about large towns and cities, especially the metropolis, there may not be a demand for a coarser kind of rice but the demand for it in the villages should be ample. These results are fairly in conformity with those of the previous *abi*.

Strains Nos. 161, 242, 263, 273, 370, 505, 539 and 543 were tested against No. 504. The results of this experiment shown in Table II are vitiated by a relatively higher borer attack in No. 504 during this than the previous season, hence, there is a lack of conformity between the two, except in the case of strains Nos. 273, 370 and 505.

Late strains were also replicated but the standard used was K 42. An unidentified disease prevented the standard from growing normally and caused many small, thin stools to appear, which did not develop heads of paddy. This is why the performance of the standard was poor throughout and the results shown in the Table IV do not coincide with those of the previous year.

*Tabi Season*.—The plots used for paddy work in the *tabi* season were the same as in the past years, facing the farm sheds. They were evenly manured at the rate of 51,200 lbs. of compost per acre, and, brown paper sheets with paddy seeds mounted on them as stated above, were put down in the ploughed, puddled and levelled land and covered with silt on Behman 2, 1343 F. Good germination occurred by the 13th of the same month and transplanting was done from Isfandar 19, to Isfandar 22, 1343 F. All the seedlings revived by Farwardi 7, 1343 F. Hispa trouble appeared in a severe form from Farwardi 22, and continued till Ardibehisht 5, 1343 F. Constant hand-picking of the adults and also the plucking of grub-containing leaves and the destruction of both was done every day. Also spraying with a mixture of lead arsenate and Pysect was done. The severity of the attack fell off with the advance of the season and the growth of the crop. The earliest flowering occurred on Ardibehisht 8, in strain No. 58 and harvest was started on Khoordad 31, 1343 F.

Table V shows that of the four strains Nos. 242, 504, 539 and 541, which were compared to No. 263, all

except the first were inferior by 10–24 per cent.; whereas No. 242 was 5 per cent. superior in yield to the standard. Strain No. 161 was found to be 4 per cent. better than No. 242 and strain No. 370, 3 per cent. Table VI shows that of the 99 strains tested against No. 263 as the standard, sixteen were superior in the ratio of from 1:1.1 to 1:1.7. These were Nos. 66, 161, 242, 246, 247, 248, 290, 336, 337, 476, 477, 481, 484, 486 and 500. Seventeen were equal in performance and the remaining inferior.

Table VII (*a*) shows the incidence of borer attack in the *abi* and Table VIII that in the *tabi* on the various strains. The average of all counts in the Table VII (*a*) for No. 504 and No. 263 gives the respective percentage of attack as 7.1 and 6.6. This in itself is a small difference.

#### DISTRICT WORK ON PADDY.

Work on paddy was continued as before on the three district farms of Warangal, Mehboobnagar and Sangareddi.

Table IX shows the results at Warangal in the *abi* and Table X in the *tabi* season. These are not reliable because of the uneven stand and the prevalence of the same unidentified disease as at Himayet Sagar.

At Mehboobnagar (c.f. Table XI) there had been an inundation of the replication plots a month before harvest, hence, the results here also are undependable.

Strains Nos. 38, 263 and 504 were replicated with the local Texannel as the standard at the Sangareddi Farm. The experiment was put down in duplicate. Table XIII (*a*) shows that in both the series No. 263 is superior to the Texannel by 20 per cent., whereas No. 504 is on a par with it. However, No. 504 has finer grain. No. 38 proved 1 to 5 per cent. inferior to the local standard. These results are fairly consistent, when compared to the last crop year.

The *tabi* results at Mehboobnagar are unreliable as the stand was uneven and there were only a few plants with heads in each row.

At Sangareddi only No. 263 proved to be better than the standard Texannel by 5.7 per cent. in the *tabi* season. Texannel was 2.5 per cent. superior to No. 504 in the duplicate series and 6.6 per cent. in the original.

Next season it is intended to import for trial at Himayet Sagar a large number of new samples of paddy from several provinces in British India as also from the State of Mysore.

TABLE I.

PADDY STRAINS IN ABI 1342-43 F. (1933) AT HIMAYET SAGAR.

*Showing the Comparative per plant Yields of Early Strains and of the Adjacent Standard 263 and The Yield Ratio between the Two.*

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent 263	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
1	503	46.2	38.0	1 : 1.2	
2	502	46.2	38.0	1 : 1.2	
3	539	41.7	38.0	1 : 1.1	
4	541	51.4	49.2	1 : 1.0	
5	483	31.6	30.7	1 : 1.0	
6	68	29.2	28.9	1 : 1.0	
7	133	30.0	30.1	1 : 1.0	
8	269	28.3	28.9	1 : 1.0	
9	496	40.3	41.8	1 : 1.0	
10	366	28.5	29.9	1 : 1.0	
11	94	29.7	31.3	1 : 1.0	
12	476	27.8	29.2	1 : 1.0	
13	507	26.4	28.0	1 : 0.9	
14	115	28.2	29.8	1 : 0.9	
15	551	36.0	38.0	1 : 0.9	
16	271	32.0	34.3	1 : 0.9	
17	336	29.2	32.0	1 : 0.9	
18	263	27.6	30.1	1 : 0.9	
19	523	41.2	44.9	1 : 0.9	
20	161	25.3	28.0	1 : 0.9	
21	75	28.4	31.3	1 : 0.9	
22	505	24.9	28.0	1 : 0.9	
23	242	27.7	30.9	1 : 0.9	
24	273	28.5	32.2	1 : 0.9	
25	469	27.9	31.0	1 : 0.9	
26	4	31.7	35.5	1 : 0.9	
27	528	37.6	41.9	1 : 0.9	
28	245	27.5	31.3	1 : 0.9	
29	275	30.3	34.3	1 : 0.9	
30	482	32.0	36.3	1 : 0.9	
31	189	26.3	29.8	1 : 0.9	
32	184	26.0	29.8	1 : 0.9	
33	72	26.7	30.9	1 : 0.9	
34	104	26.7	30.9	1 : 0.9	
35	337	29.6	24.2	1 : 0.9	

TABLE I—(concl'd.)

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent 263	Yield Ratio Standard: Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
36	248	29.1	33.6	1 : 0.9	
37	474	25.7	29.8	1 : 0.9	
38	486	27.2	31.8	1 : 0.9	
39	70	29.4	34.2	1 : 0.9	
40	481	29.0	34.2	1 : 0.9	
41	181	26.2	30.7	1 : 0.9	
42	334	25.4	29.8	1 : 0.9	
43	372	39.1	45.6	1 : 0.9	
44	371	25.2	29.9	1 : 0.9	
45	365	24.3	28.9	1 : 0.8	
46	494	24.7	29.2	1 : 0.8	
47	500	24.7	29.2	1 : 0.8	
48	244	28.7	34.0	1 : 0.8	
49	475	24.7	29.9	1 : 0.8	
50	340	24.1	28.8	1 : 0.8	
51	264	30.9	37.1	1 : 0.8	
52	497	28.3	33.9	1 : 0.8	
53	65	26.5	31.8	1 : 0.8	
54	478	26.6	31.7	1 : 0.8	
55	82	41.3	49.2	1 : 0.8	
56	247	30.6	37.1	1 : 0.8	
57	385	29.2	35.5	1 : 0.8	
58	390	26.3	32.0	1 : 0.8	
59	370	26.2	32.0	1 : 0.8	
60	66	30.6	37.4	1 : 0.8	
61	192	26.9	33.6	1 : 0.8	
62	501	32.4	39.8	1 : 0.8	
63	330	24.2	29.9	1 : 0.8	
64	162	27.2	33.6	1 : 0.8	
65	246	32.3	40.3	1 : 0.8	
66	498	27.3	33.9	1 : 0.8	
67	471	24.7	30.7	1 : 0.8	
68	38	24.9	31.0	1 : 0.8	

TABLE II.

PADDY REPLICATIONS IN ABI 1342-43 F. (1933) AT HIMAYET SAGAR.

*Showing Comparative per plant Yields of Early Strains and Standards and Their Comparative Worth in Terms of Percentages.*

(1) Standard and Strain	Per Plant Yield (Dry Weight) Grams	How Much Better	Percentage of Borer* Attack	Mean-date of flower- ing of Standard and Strain	No. of Grains Per Gram	Length × Breadth of Grain	Common Name of Pro- genitor Varieties
263 } (1) 504 }	40.15 29.86	263 is 34.5 % better than 504	3.9 6.9	5th Sept. 8th Sept.	42.0 51.0	.84 × .7 1.1 × .25	Gandharnikkoo. Ramabanaloo.
263 } 539 }	42.73 44.68	539 is 4.6 % better than 263	5.0 19.0	5th Sept. 22nd.-23rd Sept.	.. 40.5	.. .96 × .26	Rajahumsa.
263 } 273 }	42.66 34.62	263 is 23 % better than 273	6.0 9.0	5th Sept. 1st-2nd Sept.	.. 42.0	.. .86 × .25	Gandharnikkoo
263 } 370 }	38.86 32.60	263 is 19.2 % better than 370	5.1 7.1	5th Sept. 2nd-3rd Sept.	.. 47.0	.. .86 × .26	Teksanal.
263 } 505 }	42.62 35.44	263 is 20 % better than 505	6.0 8.0	5th Sept. 4th Sept.	.. 43.5	.. .88 × .25	Teksanal.
263 } 242 }	39.93 36.27	263 is 10.09 % better than 242	16.6 20.0	5th Sept. 2nd-3rd Sept.	.. 44.5	.. .92 × .25	Teksanal.
263 } 161 }	40.75 36.28	263 is 12 % better than 161	3.4 4.9	5th Sept. 3rd-4th Sept.	.. 46.5	.. .94 × .25	Nizam Gowd.

504 } 539 }	26.79 41.04	539 is 53 % better than 504	8.1 2.5	8th Sept. 22nd-23rd Sept.	51.0 40.5	1. 1 × .25 .96 × .26
504 } (1) 543 }	31.72 22.36	504 is 42 % better than 543	6.2 4.7	8th Sept. 15th-16th Sept.	.. 51.0	.. .9 × .25
504 } 273 }	30.25 34.20	273 is 13 % better than 504	5.5 6.2	8th Sept. 1st-2nd Sept.	.. 42.0	.. .86 × .25
504 } 370 }	28.10 32.96	370 is 17 % better than 504	9.6 10.2	8th Sept. 2nd-3rd Sept.	.. 47.0	.. .86 × .26
504 } 505 }	27.40 33.98	505 is 24 % better than 504	5.6 5.4	8th Sept. 4th Sept.	.. 43.5	.. .88 × .25
504 } 242 }	22.32 29.34	242 is 31 % better than 504	6.3 5.0	8th Sept. 2nd-3rd Sept.	.. 44.5	.. .92 × .25
504 } 161 }	21.62 28.72	161 is 33 % better than 504	7.3 6.8	8th Sept. 3rd-4th Sept.	.. 46.5	.. .94 × .25
504 } 263 }	21.31 29.44	263 is 38 % better than 504	8.0 5.0	8th Sept. 5th Sept.	51.0 42.0	1. 1 × .25 .84 × .7

Ramabanaloo.  
Basmati.

(1) Shown First.

\* Average per cent. attack of stem-borer

	in
504	263
7.1	6.4

TABLE III.

PADDY STRAINS IN ABI 1342-43 F. (1933) AT HIMAYET SAGAR.

*Showing the Comparative per plant Yields of Late Strains and of the Adjacent Standard K 42 and The Yield Ratio between the Two.*

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent K 42	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
1	179	27.0	13.8	1 : 2.0	
2	169	25.3	13.8	1 : 1.8	
3	167	24.3	13.8	1 : 1.8	
4	344	45.6	29.4	1 : 1.6	
5	164	26.0	16.8	1 : 1.5	
6	363	39.7	25.7	1 : 1.5	
7	375	32.4	21.0	1 : 1.5	
8	515	29.2	19.0	1 : 1.5	
9	282	26.8	17.5	1 : 1.5	
10	168	21.1	13.8	1 : 1.5	
11	200	28.6	18.7	1 : 1.5	
12	184	26.8	17.8	1 : 1.5	
13	201	27.6	18.7	1 : 1.5	
14	24	30.4	20.7	1 : 1.5	
15	216	26.4	18.4	1 : 1.4	
16	124	29.8	20.9	1 : 1.4	
17	196	28.0	19.9	1 : 1.4	
18	61	33.5	23.9	1 : 1.4	
19	26	27.7	20.0	1 : 1.3	
20	120	28.3	20.4	1 : 1.4	
21	198	25.9	18.7	1 : 1.4	
22	204	25.8	18.8	1 : 1.4	
23	266	24.1	17.5	1 : 1.4	
24	160	23.7	17.8	1 : 1.3	
25	509	31.4	23.8	1 : 1.3	
26	163	23.2	16.8	1 : 1.3	
27	518	25.0	19.0	1 : 1.3	
28	1	25.7	19.5	1 : 1.3	
29	7	25.7	19.7	1 : 1.3	
30	13	16.0	19.7	1 : 1.3	
31	350	33.2	25.5	1 : 1.3	
32	389	28.8	21.0	1 : 1.3	
33	95	23.2	21.8	1 : 1.3	
34	166	21.8	16.8	1 : 1.3	
35	387	25.5	21.0	1 : 1.3	

TABLE III.—(contd.)

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent K 42	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
36	220	23.8	18.4	1 : 1.3	
37	199	30.2	18.7	1 : 1.3	
38	36	24.4	19.0	1 : 1.3	
39	194	25.5	19.8	1 : 1.3	
40	423	29.0	22.6	1 : 1.3	
41	410	31.5	24.7	1 : 1.3	
42	119	26.3	20.4	1 : 1.3	
43	86	27.8	21.8	1 : 1.3	
44	356	36.5	29.0	1 : 1.3	
45	352	36.6	29.0	1 : 1.3	
46	345	37.3	29.4	1 : 1.3	
47	288	23.6	18.8	1 : 1.3	
48	320	34.5	27.4	1 : 1.3	
49	357	37.5	29.0	1 : 1.3	
50	328	36.0	28.1	1 : 1.2	
51	531	26.5	21.3	1 : 1.2	
52	343	34.7	28.1	1 : 1.2	
53	517	23.4	19.0	1 : 1.2	
54	28	25.3	20.7	1 : 1.2	
55	165	20.5	16.8	1 : 1.2	
56	513	29.7	24.4	1 : 1.2	
57	359	31.3	25.7	1 : 1.2	
58	12	24.0	19.7	1 : 1.2	
59	18	22.1	18.1	1 : 1.2	
60	128	21.5	17.8	1 : 1.2	
61	376	25.0	21.0	1 : 1.2	
62	305	19.7	16.5	1 : 1.2	
63	28	23.9	20.0	1 : 1.2	
64	20	21.3	18.1	1 : 1.2	
65	37	22.6	19.0	1 : 1.2	
66	510	28.0	23.8	1 : 1.2	
67	322	32.2	27.4	1 : 1.2	
68	324	33.1	28.1	1 : 1.2	
69	300	21.9	16.5	1 : 1.2	
70	309	31.7	27.4	1 : 1.2	
71	78	31.7	27.5	1 : 1.2	
72	34	21.9	18.0	1 : 1.2	
73	27	23.1	20.0	1 : 1.2	
74	421	28.3	24.8	1 : 1.1	
75	87	25.0	21.8	1 : 1.1	
76	127	24.0	20.9	1 : 1.1	

TABLE III.—(contd.)

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Ad- jacent K 42	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
77	197	22.7	19.8	1 : 1.1	
78	210	21.5	18.8	1 : 1.1	
79	306	45.7	39.8	1 : 1.1	
80	351	29.2	25.5	1 : 1.1	
81	542	27.4	24.0	1 : 1.1	
82	408	28.0	24.7	1 : 1.1	
83	224	23.7	20.0	1 : 1.1	
84	114	24.0	20.4	1 : 1.1	
85	529	26.1	23.4	1 : 1.1	
86	80	30.6	27.5	1 : 1.1	
87	8	22.6	19.7	1 : 1.1	
88	17	26.0	25.7	1 : 1.0	
89	19	19.4	18.1	1 : 1.0	
90	29	20.0	20.0	1 : 1.0	
91	42	21.2	21.1	1 : 1.0	
92	62	29.3	23.9	1 : 1.0	
93	520	25.7	23.4	1 : 1.1	
94	514	26.7	24.4	1 : 1.1	
95	417	27.1	24.8	1 : 1.1	
96	89	23.8	21.8	1 : 1.1	
97	46	23.8	21.7	1 : 1.1	
98	139	19.4	17.8	1 : 1.1	
99	539	22.8	21.3	1 : 1.1	
100	412	27.5	25.5	1 : 1.1	
101	32	22.8	21.4	1 : 1.1	
102	39	20.3	19.0	1 : 1.1	
103	347	31.2	29.4	1 : 1.1	
104	425	23.8	22.6	1 : 1.1	
105	348	26.8	25.5	1 : 1.1	
106	332	29.7	28.1	1 : 1.1	
107	349	26.7	25.5	1 : 1.0	
108	550	27.2	22.0	1 : 1.0	
109	396	24.5	23.6	1 : 1.0	
110	31	22.1	21.4	1 : 1.0	
111	6	20.0	19.5	1 : 1.0	
112	77	30.0	23.9	1 : 1.0	
113	83	28.2	27.5	1 : 1.0	
114	254	20.4	20.0	1 : 1.0	
115	459	24.6	24.2	1 : 1.0	
116	413	22.9	25.5	1 : 1.0	

TABLE III.—(concl'd.)

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent K 42	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
117	360	26.0	25.7	1 : 1.0	
118	283	19.1	18.8	1 : 1.0	
119	521	23.3	23.4	1 : 1.0	
120	511	24.0	24.4	1 : 1.0	
121	308	27.0	27.4	1 : 1.0	
122	221	18.1	18.4	1 : 1.0	
123	346	28.8	29.4	1 : 1.0	
124	418	24.3	24.8	1 : 1.0	
125	516	18.6	19.0	1 : 1.0	
126	411	24.7	25.5	1 : 1.0	
127	512	23.6	24.4	1 : 1.0	
128	307	38.6	39.8	1 : 1.0	
129	122	20.2	20.9	1 : 1.0	
130	452	24.4	25.7	1 : 0.9	
131	400	22.3	23.6	1 : 0.9	
132	394	22.1	23.6	1 : 0.9	
133	399	22.0	23.6	1 : 0.9	
134	30	20.6	21.4	1 : 0.9	
135	59	21.8	23.9	1 : 0.9	
136	416	23.3	25.5	1 : 0.9	
137	534	22.2	24.5	1 : 0.9	
138	426	21.9	24.3	1 : 0.9	
139	22	18.4	20.7	1 : 0.9	
140	50	24.5	28.0	1 : 0.9	
141	437	25.2	26.0	1 : 0.9	
142	21	16.1	18.1	1 : 0.9	
143	85	23.7	27.5	1 : 0.9	
144	428	21.0	24.3	1 : 0.9	
145	49	24.0	28.0	1 : 0.9	
146	409	21.1	24.7	1 : 0.9	
147	449	25.1	29.2	1 : 0.9	
148	454	22.2	25.7	1 : 0.9	
149	530	18.3	21.3	1 : 0.9	
150	33	18.0	21.4	1 : 0.8	
151	419	20.6	24.8	1 : 0.8	
152	427	20.3	24.3	1 : 0.8	
153	434	23.9	23.7	1 : 0.8	
154	447	24.3	29.2	1 : 0.8	
155	460	20.0	24.2	1 : 0.8	
156	250	16.5	20.0	1 : 0.8	
157	222	16.1	20.0	1 : 0.8	
158	429	19.5	24.3	1 : 0.8	

... B.—Almost all the rows of the Standard K 42 were diseased, resulting in many weak tillers and only a few well developed heads.

TABLE IV.

## PADDY REPLICATIONS IN ABI 1842-43 F. (1933) AT HIMAYET SAGAR.

Showing Comparative Per Plant Yields of Late Strains and Standards and Their Comparative Worth in Terms of Percentages.

(1) Standard and Strain	Per Plant Yield (Dry- weight) Grams	How Much Better	Percentage of Borer Attack	Mean-date of flowering of Standard & Strain	No. of Grains Per Gram	Length × Breadth of Grain	Common Name of Progenitor Varieties
1	2	3	4	5	6	7	8
K 42 37	19.30 20.93	37 is 5% better than K 42	7.7 7.9	5th-6th Oct. 9th-10th Oct.	69.5 39.5	.7 × .2 .86 × .25	Kolumba. Pedda Wadlu.
	27.45 32.34	37 is 18% better than K 42	5.3 6.5	.. ..	.. ..	.. ..	
K 42 18	23.23 29.89	18 is 29% better than K 42	17.5 14.4	.. 8th-9th Oct.	.. 39.0	.. .88 × .29	Nirugumaloo.
	20.54 31.04	266 is 51% better than K 42	19.8 11.7	.. 7th Oct.	.. 49.5	.. .98 × .22	Gandharnikkoo (coarse)
K 42 306	23.67 32.70	306 is 38% better than K 42	19.5 23.3	.. 1st-2nd Oct.	.. 32.5	.. .82 × .26	Strain No. 81 from Muglad.

K 42 359	21.89. 32.28	359 is 47% better than K 42	20.5 3.8	.. 6th-7th Oct.	.. 57.5	.. .68 × .2	Mori Guttal (Rather fine grained).
K 42 423	21.19 28.17	423 is 35% better than K 42	30.9 25.1	.. 9th-10th Oct.	.. 61.0	.. .7 × .2	Selection from No. 359 (Fine-grained).
K 42 21	20.03 25.69	21 is 28% better than K 42	25.3 21.1	.. 8th-9th Oct.	.. 41.0	.. .88 × .25	Nizam Gowd.
K 42 127	23.42 29.50	127 is 26% better than K 42	.. ..	.. 22nd Oct.	.. 60.0	.. .82 × .22	Kichni Samba.
K 42 360	20.29 24.98	360 is 23 % better than K 42	.. ..	.. 5th Oct.	.. 35.5	.. .8 × .28	Beet Gowdal.
K 42 6	19.45 20.76	6 is 7% better than K 42	.. ..	.. 8th-9th Oct.	.. 40.5	.. .8 × .29	Beet Wadloo.
K 42 521	18.51 23.17	521 is 25% better than K 42	.. ..	.. 30th-Oct.	.. 47.5	.. .84 × .25	Delhibhogun (too-late)
K 42 29	16.24 21.70	29 is 34% better than K 42	.. ..	.. 9th Oct.	.. 41.0	.. .9 × .23	
K 42 80	16.10 20.17	80 is 25 % better than K 42	.. ..	.. 6th Oct.	.. 38.5	.. .98 × .2	American (Rather fine grained).

N.B.—The Standard lines of K 42 were almost all diseased by an unknown disease resulting in many weak tillers and only a few well developed heads. Hence the Yields are not normal.  
(1) Shown first

TABLE V.  
PADDY REPLICATIONS IN TABI 1343 F. (1934) AT HIMAYETSAGAR.

*Showing Comparative Per Plant Yields of Strains and Standards and Their Comparative Worth in Terms of Percentages.*

Standard and Strain	Per Plant Yield (Dry-weight) Grams	How Much Better	Percentage of Borer Attack	Mean-date of flowering of Standard & Strain	No. of Grams Per Grain	Length × Breadth of Grain	Common Name of Progenitor Varieties
1	2	3	4	5	6	7	8
( <sup>1</sup> ) 242 263	23.7 22.9	242 is 5% better than 263	2.5 3.8	20th-21st March 25th-26th March	51.5 45.0	. 9 × .2 . 8 × .25	Teksanal. Gandharnikkoo.
242 161	23.4 24.4	161 is 4% better than 242	4.7 3.9	.. 21st-22nd March	.. 62.0	.. . 9 × .21	.. Early Nizam Gowd
242 370	23.9 24.5	370 is 3% better than 242	2.6 4.3	.. 19th-20th March	.. 53.0	.. . 9 × .21	.. Teksanal.
( <sup>1</sup> ) 504 263	20.9 22.9	263 is 10% better than 504	5.0 5.0	25th March ..	52.0 ..	.. ..	Ramabanaloo. ..
504 543	16.2 9.8	504 is 66% better than 543	7.0 10.0	.. 25th-26th March	.. ..	1.18 × .2 . 9 × .2	.. Basmati.

(1) 539 503	18.4 18.7	503 is 1.9% better than 539	4.0 4.0	25th-26th March 24th-25th March	61.0 52.0	.98 × .25 .7 × .25	Rajahunsa Palasanaloo.
539 502	21.2 19.0	539 is 11% better than 502	4.0 3.0	.. 21st-22nd March	50.0	.. .8 × .25	Palasanaloo.
539 504	21.3 21.1	539 is 1% better than 504	5.0 5.0	.. ..	.. ..	.. ..	
539 263	19.9 22.6	263 is 14% better than 539	5.0 4.0	.. ..	.. ..	.. ..	
263 504	19.0 17.0	263 is 12% better than 504	3.0 6.0	.. ..	.. ..	.. ..	
541 539	20.4 28.7	539 is 16% better than 541	6.0 5.0	23rd-25th March	64.5	.9 × .2	Single Plant Selection from 504.
541 503	19.8 23.6	503 is 19% better than 541	9.0 9.0	.. ..	.. ..	.. ..	
541 502	19.1 19.9	502 is 4% better than 541	9.0 6.0	.. ..	.. ..	.. ..	
541 263	18.1 22.3	263 is 21% better than 541	9.0 6.0	.. ..	.. ..	.. ..	
541 504	14.9 16.1	504 is 8% better than 541	9.0 7.0	.. ..	.. ..	.. ..	

TABLE VI.

PADDY STRAINS IN TABI 1848 F. (1933-34) AT HIMAYET SAGAR.

*Showing the Comparative Per Plant Yields of 99 Strains and of the Adjacent Standard 263 and The Yield Ratio between the Two.*

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent 263	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
1	290	15.4	12.0	1 : 1.3	
2	161	20.5	18.3	1 : 1.1	
3	66	25.8	24.1	1 : 1.7	
4	476	22.7	16.2	1 : 1.4	
5	247	23.4	18.6	1 : 1.3	
6	500	20.9	16.2	1 : 1.2	
7	477	18.4	16.2	1 : 1.1	
8	484	18.2	16.3	1 : 1.1	
9	486	18.0	16.3	1 : 1.1	
10	246	20.5	18.6	1 : 1.1	
11	476	21.1	18.6	1 : 1.1	
12	248	22.0	18.3	1 : 1.1	
13	336	23.4	26.1	1 : 1.1	
14	337	20.1	18.6	1 : 1.1	
15	242	28.6	26.7	1 : 1.1	
16	481	19.8	18.6	1 : 1.1	
17	273	27.7	26.7	1 : 1.0	
18	112	16.8	16.3	1 : 1.0	
19	76	26.9	26.1	1 : 1.0	
20	69	24.0	23.5	1 : 1.0	
21	84	23.1	22.7	1 : 1.0	
22	162	18.5	18.3	1 : 1.0	
23	269	23.0	22.7	1 : 1.0	
24	482	26.2	25.8	1 : 1.0	
25	64	24.4	24.1	1 : 1.0	
26	496	27.4	27.1	1 : 1.0	
27	263	25.9	25.8	1 : 1.0	
28	244	26.1	26.1	1 : 1.0	
29	366	23.2	23.2	1 : 1.0	
30	75	22.3	22.7	1 : 1.0	
31	217	11.6	12.0	1 : 1.0	
32	267	22.1	23.2	1 : 1.0	
33	370	24.8	26.1	1 : 1.0	
34	65	23.6	24.1	1 : .9	
35	483	17.5	15.3	1 : .9	
	507	22.6	23.3	1 : .9	

TABLE VI.—(contd.).

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Adjacent 268	Yield Ratio Strain : Standard	Remarks
		Grams	Grams		
1	2	3	4	5	6
37	494	22.0	23.5	1 : .9	
38	340	22.2	23.5	1 : .9	
39	504	21.5	23.0	1 : .9	
40	365	21.8	23.5	1 : .9	
41	104	25.1	26.1	1 : .9	
42	497	24.4	26.3	1 : .9	
43	270	22.4	24.1	1 : .9	
44	106	24.0	26.0	1 : .9	
45	369	24.3	26.3	1 : .9	
46	275	24.3	26.7	1 : .9	
47	367	23.6	25.8	1 : .0	
48	238	22.0	24.1	1 : .9	
49	240	24.6	27.1	1 : .9	
50	73	24.0	26.7	1 : .9	
51	245	20.1	22.7	1 : .9	
52	74	23.0	26.3	1 : .9	
53	277	23.0	26.7	1 : .9	
54	281	22.8	26.3	1 : .9	
55	233	21.7	25.2	1 : .9	
56	100	15.8	18.3	1 : .9	
57	371	19.7	23.2	1 : .9	
58	526	22.4	28.0	1 : .9	
59	267	22.1	23.1	1 : .8	
60	226	19.6	23.2	1 : .8	
61	229	24.4	29.4	1 : .8	
62	415	15.4	18.6	1 : .8	
63	105	20.1	24.1	1 : .8	
64	330	19.9	23.0	1 : .8	
65	487	21.3	25.8	1 : .8	
66	115	24.0	29.4	1 : .8	
67	334	19.8	25.2	1 : .8	
68	505	18.6	23.2	1 : .8	
69	271	21.6	26.7	1 : .8	
70	38	21.0	26.0	1 : .8	
71	212	16.1	20.4	1 : .8	
72	159	16.2	20.4	1 : .8	
73	539	20.7	26.2	1 : .8	
74	102	20.9	26.7	1 : .8	
75	189	20.4	26.0	1 : .8	
76	502	17.7	23.4	1 : .8	

TABLE VI -(concl'd.)

Serial No.	Strain No.	Per Plant Yield	Per Plant Yield of Ad- jacent 263	Yield Ratio Standard : Strain	Remarks
		Grams	Grams		
1	2	3	4	5	6
77	503	19.4	26.2	1 : .7	
78	82	20.6	28.0	1 : .7	
79	72	25.0	33.6	1 : .7	
80	297	14.7	20.4	1 : .7	
81	110	15.1	20.9	1 : .7	
82	265	24.1	33.6	1 : .7	
83	70	17.4	24.1	1 : .7	
84	219	18.1	26.0	1 : .7	
85	109	17.7	24.1	1 : .7	
86	4	19.0	27.4	1 : .7	
87	264	23.1	33.6	1 : .7	
88	58	14.1	20.9	1 : .7	
89	81	19.1	29.4	1 : .7	
90	541	15.1	23.4	1 : .7	
91	225	9.7	16.3	1 : .6	
92	206	9.7	16.3	1 : .6	
93	2	15.9	27.4	1 : .6	
94	501	11.6	20.4	1 : .6	
95	67	18.7	33.6	1 : .6	
96	407	15.7	28.0	1 : .6	
97	451	13.7	25.6	1 : .5	
98	535	P.S.W. 11.3	20.9	1 : .5	
99	527	13.7	26.2	1 : .5	

TABLE VII (a).

*Incidence of Stem-Borer attack in Early Replicated Paddy Strains.  
Abi 1842-43 F. (1933) Himayet Sagar.*

Strains	TILLERS		Incidence per cent.	Remarks
	Total	Borer attacked		
1	2	3	4	5
504	3,420	237	6.9	
263	4,597	178	3.9	
370	3,198	229	7.1	
263	4,296	222	5.1	
539	3,448	62	19.0	
263	3,952	196	5.0	
273	3,209	315	9.0	
263	3,353	267	6.0	
505	3,142	263	8.0	
263	4,351	258	6.0	
242	3,835	667	20.0	
263	4,050	675	16.6	
161	3,318	163	4.9	
263	4,145	141	3.4	
539	2,970	74	2.5	
504	3,454	280	8.0	
543	2,434	115	4.7	
504	3,661	229	6.2	
273	2,467	152	6.2	
504	3,280	181	5.5	
370	2,767	282	10.2	
504	3,690	355	9.6	
505	3,148	171	5.4	
504	3,934	222	5.6	
242	3,718	186	5.0	
504	4,322	274	6.3	
161	3,442	230	6.8	
504	4,198	309	7.3	
263	3,267	166	5.0	
504	3,938	316	8.0	

*N.B.*—Seed obtained from the *tabi* crop is planted in the following *abi*.

TABLE VII (b).

*Incidence of Stem-Borer Attack in Late Replicated Paddy Strains.  
Abi 1342-43 F. (1933) Himayet Sagar.*

Strains	TILLERS		Incidence Per cent.	Remarks
	Total	Borer attacked		
1	2	3	4	5
K 42	2,671	207	7.7	.
37	1,981	157	7.9	
K 42	3,924	210	5.3	.
37	2,859	186	6.5	
K 42	4,042	416	10.2	.
543	2,647	71	0.2	
K 42	3,618	662	17.5	.
18	2,712	391	14.4	
K 42	3,615	718	19.8	.
256	3,012	353	11.7	
K 42	3,828	747	19.5	.
306	2,085	487	23.3	
K 42	2,516	517	20.5	.
359	1,923	458	23.8	
K 42	2,285	708	30.9	.
423	1,870	470	25.1	
K 42	2,008	507	25.3	.
21	1,664	352	21.1	
K 42	..	653	..	.
127	..	418	..	
K 42	..	667	..	.
360	..	232	..	
K 42	..	777	..	.
6	..	488	..	
K 42	..	912	..	.
521	..	607	..	
K 42	..	1,305	..	.
29	..	929	..	
K 42	..	1,306	..	.
80	..	1,060	..	

*N.B.*—Seed of strains grown in *abi* planted in the following *abi*.

ABLE VIII.

*Incidence of Stem-Borer Attack in Replicated Paddy Strains.  
Tabi 1343 F. (1933-34) Himayet Sagar.*

Strain	TILLERS		Incidence Per cent.	Remarks
	Total	Borer Attacked		
1	2	3	4	5
243	2,100	53	2.5	
263	1,633	63	3.8	
242	2,095	98	4.7	
161	1,714	67	3.9	
242	2,161	56	2.6	
370	1,847	80	4.3	
504	2,026	102	5.0	
263	1,717	87	5.0	
504	1,162	77	7.0	
543	708	73	10.0	
539	2,734	102	4.0	
503	1,873	72	4.0	
539	2,962	105	4.0	
502	2,043	57	3.0	
539	2,806	134	5.0	
504	2,129	104	5.0	
539	2,768	126	5.0	
263	2,181	82	4.0	
263	2,096	64	3.0	
504	1,578	87	6.0	
541	2,484	157	6.0	
539	2,611	123	5.0	
541	2,391	226	9.0	
503	2,096	178	9.0	
541	2,369	204	9.0	
502	2,140	133	6.0	
541	2,319	205	9.0	
263	2,165	128	6.0	
541	1,769	167	9.0	
504	1,816	124	7.0	

*N.B.*—The seed of early strains grown in *Abi* are planted in the following *Tabi*.

TABLE IX.

PADDY—ARI 1842-43 F. (1933).

*Results of Late and Early Replications at the Main Farm, Warangal.*

Replications	Standard used	Per Plant Yield (Dry-weight) Grams	Mean-date of Flowering	How much Better	Remarks
1	2	3	4	5	6
LATE .	K 42	2.40	18th Oct.	AN is 405%	Adinarayan.
	AN	12.12		better than K42	
	AN	13.30	..	AN is 83%	
	29	7.26		better than 29	
	AN	38.82	..	AN is 70%	
	80	8.14		better than 80	
	AN	14.52	..	AN is 98%	
	127	7.32		better than 127	
EARLY.	P.S.	8.50	29th Sept.	P.S. is 66% better than 38	Palasanal.  Both the Stand- ard rows and the Departmental samples in early and late varieties were affected by a certain kind of dis- ease, which caused very many weak tillers to come up and very few well developed ear- heads. Hence, there was an un- even stand in all the rows.
	38	5.12	30th Sept.		
	P.S.	9.15	..	P.S. is 105% better then 504	
	504	4.46		P.S. is 164% better than 415	
	P.S.	9.17	..	P.S. is 74% better than 263	
	415	8.48			
	P.S.	10.28	..		
	263	5.90			

TABLE X.

PADDY—TABI 1343 F. (1933-34).

*Results of Early Replications at the Main Farm, Warangal.*

Replications	Per Plant Yield (Dry- weight) Grams	How Much Better	Remarks
1	2	3	4
P.S. }	1.05	263 is 18% better than P.S.	
263 }	1.24		
P.S. }	1.03	504 is 15% better than P.S.	
504 }	1.18		

*N.B.*—The crop had a poor stand and was very uneven.*P.S.*—Palasanaloo—the Standard used.

TABLE XI.

PADDY—ABI 1342-43 F. (1933).

*Results of Early and Late Replications at the Government Farm,  
Mahboobnagar.*

Replica- tions	Standard used	Per Plant Yield (Dry- weight) Grams	How Much Better	Remarks
1	2	3	4	5
EARLY ..	E.N.G.	81.41	E.N.G. is 20.4% better than 38	Plants in these rows had lodged at the time of harvest and most of them submerged under tank water
	38	26.08		
	E.N.G.	23.55	263 is 22% better than E.N.G.	
	263	28.68		
	E.N.G.	27.04	E.N.G. is 139% better than 504	
	504	11.32		
	E.N.G.	26.59	E.N.G. is 35% better than 415	
	415	19.76		
LATE ..	L.N.G.	36.68	127 is 21% better than L.N.G.	
	127	44.41		
	L.N.G.	43.25	L.N.G. is 13% better than K 42	
	K 42	38.21		
	L.N.G.	38.59	29 is 15% better than L.N.G.	
	29	44.55		
	L.N.G.	33.75	80 is 21 % better than L.N.G.	
	80	40.99		

E.N.G.=Early Nizam Gaod }  
 L.N.G.=Late Nizam Gaod } The Standards used

TABLE XII.

PADDY—TABI 1843 F.(1933-34).

*Results of Early Replications at the Government Farm, Mahboobnagar.*

Standard used E.N.G.	Per Plant Yield (Dry- weight) Grams	How Much Better	Remarks
1	2	3	4
E.N.G. } 263 }	6.2 8.9	263 is 59% Superior to E.N.G.	There were very few plants with ear-heads in each row. Stand of the crop was very uneven.
E.N.G. } 504 }	8.59 10.05	504 is 17% Superior to E.N.G.	The other plots with the replications of 539 and 154 were so bad that they had to be discarded.

TABLE XIII-(a)

PADDY—ABI 1842-48 F. (1933).

*Results of Early Replications at the Government Farm, Sangareddi.*

Series	Standard used Tex	Per Plant Yield (Dry- weight) Grams	How Much Better	Remarks
1	2	3	4	5
FIRST ..	Tex.	} 15.83	263 is 20% better than Tex.	
	263			
	Tex.	} 15.09	Tex. is 3% better than 504	
	504			
	Tex.	} 21.99	Tex. is 5% better than 38	
	38			
SECOND .	Tex.	} 24.47	263 is 26% better than Tex.	
	263			
	Tex.	} 27.21	504 is 5% better than Tex.	
	504			
	Tex.	} 25.63	Tex. is 1% better than 38	
	38			

Tex. = Texannaal—the standard used.

TABLE XIII.-(b)

PADDY—TABI 1343 F. (1933-34).

*Results of Early Replications at the Government Farm, Sungareddi*

Series	Standard used L.R. & Tex.	Per Plant Yield (Dry- weight) Grams	How Much Better	Remarks
1	2	3	4	5
MAIN SERIES.	L.R.	14.39	L.R. is 9.9% better than 541	541 is finer grained than L. R.
	541	12.96		
	Tex.	18.91	Tex. is 6.6% better than 504	504 is much finer grained than Texan- nel.
	504	12.98		
	Tex.	11.21	263 is 1% better than Tex.	263 is very coarse grained.
	263	11.32		
DUPLICATE SERIES.	L.R.	18.62	L.R. is 5.2% better than 541	
	541	17.64		
	Tex.	17.57	Tex. is 2.5% better than 504	
	504	17.13		
	Tex.	17.77	263 is 5.7% better than Tex.	
	263	18.79		

L.R.=Local Rajahunsa.

Tex.=Taxannel.

the standards used.

## CASTOR IMPROVEMENT.

This work at present consists of the study of a number of single-plant selections for their morphological characters and for their seed and oil yielding ability.

1. Plot No. 57 and No. 128 each comprising an acre were used at the Main Agricultural Experiment Station at Himayet Sagar. Plot No. 57 is to the east of the main road of the farm running past the farm-store and plot No. 128 is to the west. The former was called for our purposes Plot I and divided into three sections measuring  $120' \times 103'$  each with an alley-way 4' wide. In all, the seed of high-yielding single-plant selections was sown each in a row by itself containing 70 single-seeded hills spaced  $1\frac{1}{2}'$  apart. The rows were spaced 3' apart. At the two borders of every section was planted an extra row of the same selection, which appeared next to that particular border row in order to avoid the border effect. The selections were numbered serially from 622 to 718.

That part of Farm Plot No. 128 used for our work consisted of two sub-plots, which were numbered as Plot II and III, and each was divided into two equal sections of  $103' \times 60'$  with a pathway of 4' between the two sections. Here also the planting was done in the same way as in Plot I. The selections used were from 719 to 756 in Plot II and from 757 to 769 in Plot III with duplicate sowings of 622, 628, 639, 647, 651, 657-659, 669, 680, 686, 704 and 705. Out of the total of selections used 20 were called types. Each of these was taken for study of a single character for which it was typical and had been isolated, *viz.*, very small seed; very large seed; late flowering, etc.

The sowing was done from Amardad 28-30, 1342 F. (July 3-5, 1933). The land was unmanured and was prepared (ploughed and harrowed) in the usual way by the General Section. Several times during the season bullock-hoeing, 'norcrossing' and hand-weeding were done as required. The crop grew well but the trouble of its being ununiform, due to great soil variation so characteristic of the farm plots, again appeared in the year under report.

This year also as in the previous ones more than 60 per cent. of our plants had mostly female spikes, *i.e.*,

fruits were developed all along the spike almost down to its base. The cultivators' crops as a rule show only perhaps 5 per cent. of the plants having this characteristic. As none of our material is yet absolutely pure it was decided at the last departmental meeting of officers to have recourse to rouging in the crop raised on the Farm from seed of several plants supplied by the Economic Botanist. In this crop all off-type plants, that is, those not having spikes with mostly female flowers, were to be removed. The seed obtained from the remaining "mostly female" plants would be then distributed to the cultivators until a few high-yielding, mostly female pure-lines of castor had been isolated.

Thus far, practically all of our selections have shown a good tendency to branching. It has seemed desirable also to make an effort to isolate strains with less profuse branching and with a single well developed spike. If high yielding strains of the last kind could be secured, they would prove an economic advantage to the cultivator, who would then have to harvest his plants at one operation, just breaking off the central spike. At present, his crop being branched, he has to pick the fruit from several spikes, which is a laborious and repeated process as all the spikes on a branched castor plant do not mature simultaneously. Many a time the cultivator delays his picking until a large number of spikes in his crop have matured. This leads to dehiscence of the over-ripe fruits and the scattering of seed. The seed thus shattered is no doubt ultimately collected but a great deal of it remains on the ground as is evinced by the appearance of self-sown castor plants in the fields the following season. Loss of labour, material and time, which means so much cash, results and could be well avoided by giving the cultivator a strain with mono-spiked plants. It is hoped that before long we shall have such strains in our material.

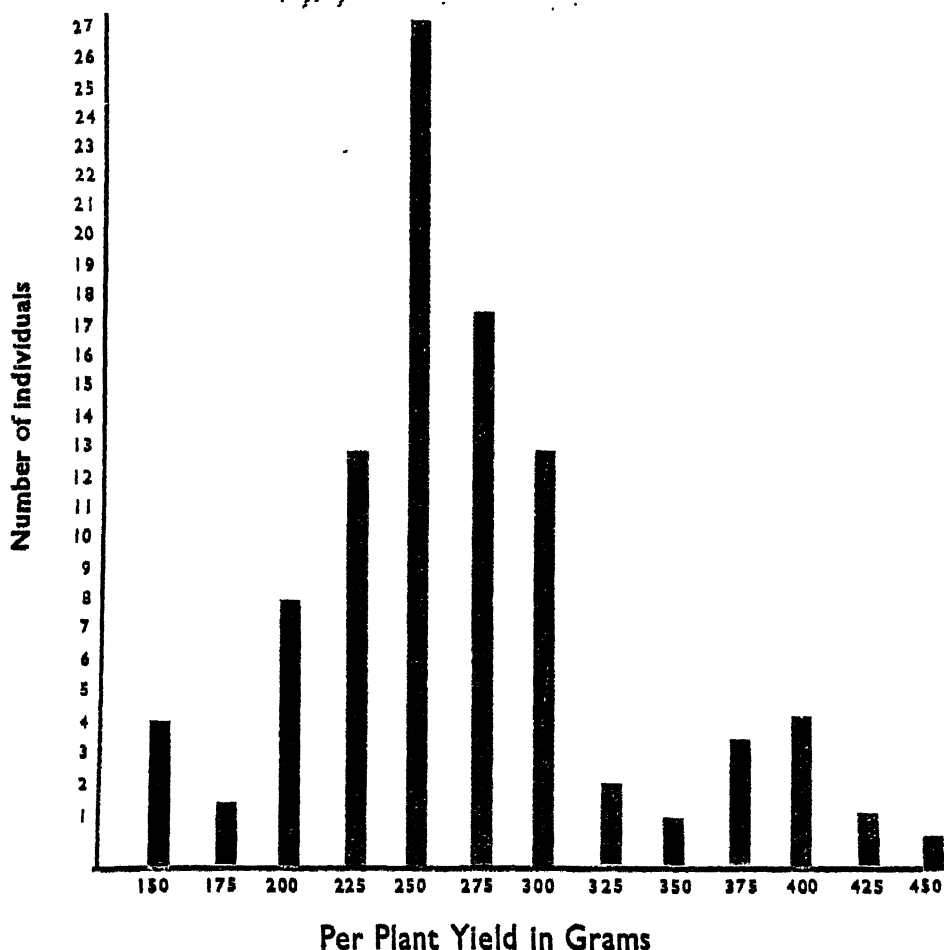
In the past years a number of crosses were also made between pure strains of red stemmed plants with non-spiny fruits and green stemmed plants with spiny fruits, having a mostly female spike. The idea was to evolve a type having green stems and mostly female spikes with non-spiny fruits. It has been observed that spiny fruits are very much attacked by insects such as the castor capsule-borer and *Euphroctis fraterni*, which

latter damage the spines particularly. This is especially so, if the spikes happen to be compact. Non-spiny fruits have not been observed to suffer to this extent from insect attack. Therefore, to evolve a type, either red or green stemmed, with mostly female, fairly large and compact spikes with non-spiny fruits would be a decided advantage. We have succeeded thus far in obtaining plants with these characters except large size of spike and they are being studied at the present time. Non-spiny fruits have another advantage. Unlike spiny fruits they do not damage machinery in decorticating.

However, the chief part of our work consisted of the study of the progeny of high yielding plants of the previous season. Appendix I shows some of the important characters such as date of flowering, nature of spike, yield of seed per plant and oil per cent. on the whole seed of the selections used and their parents. Taking up the most important economic characters, namely, yield of seed and oil per cent. on the whole seed, we find that the seed averages of the various sets shown in column (ii) vary from 158.00 gms. per plant to 456.66 gms. per plant with the mean at 271.04 gms. The bulk of our material or 71 per cent. to be exact lies within the comparatively narrow range of 225.00 gms.—300.00 gms. of seed yield per plant. The bar chart given below graphically shows this position.

## CHART I.

Average per plant seed yield of Castor Selections.

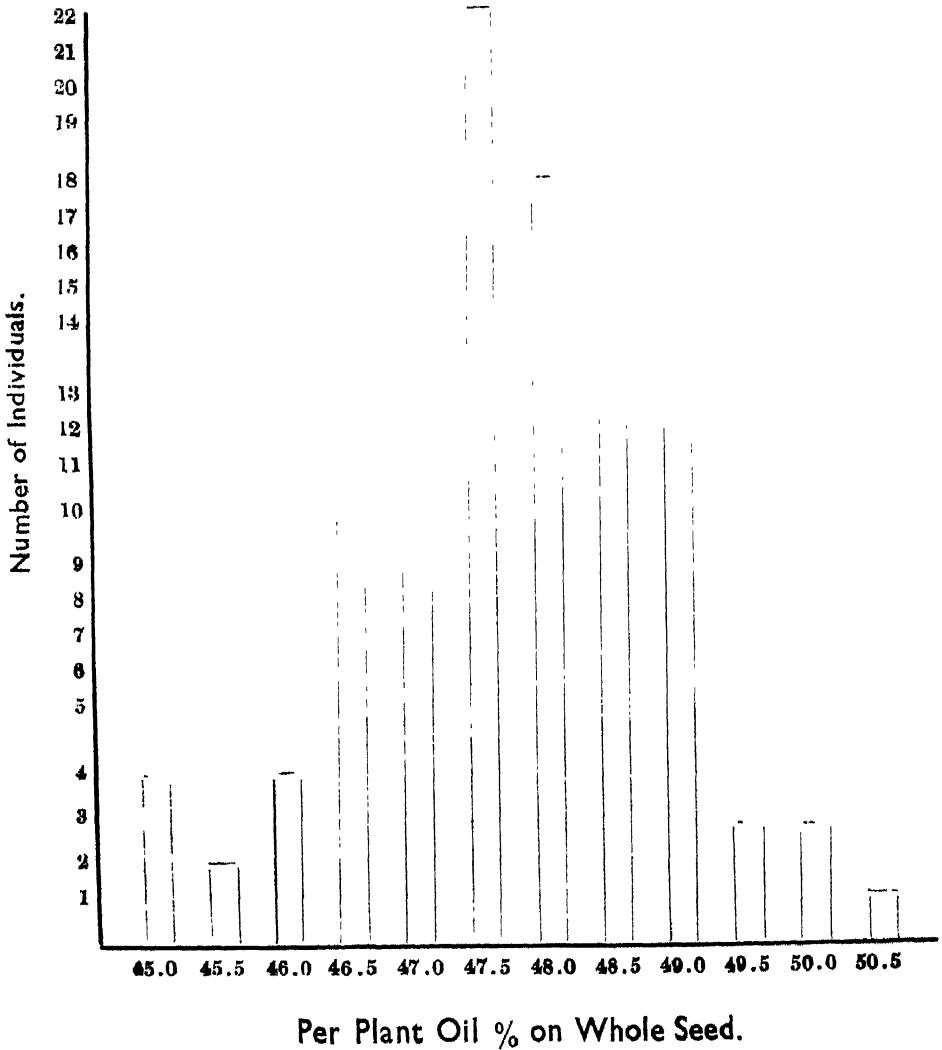


The chart shows that our material is not pure. In fact it evidently falls into two groups. The range of the larger group is 150.00 gms. to 325.00 gms. per plant and of the other smaller group is from 350.00 gms. to 450.00 gms. The curve, as the bar-chart above shows, is bimodal. Here we have an opportunity of isolating several high yielding pure-lines in each of the two groups.

Regarding the oil figures we note from Chart 2 given below that most of the material 83 per cent. is concentrated round the class 47.50 per cent. of oil per plant. The mean is  $47.72 \pm 0.7$  per cent., which gives narrow limits of 47.65 per cent.—47.49 per cent. The standard deviation is only  $1.17 \pm 0.06$  per cent.

## CHART 2

Average Per Plant Oil percent  
on  
Whole Seed  
of  
Castor Selections.



One great difficulty has been experienced thus far in regard to the study of oil percentage in our material. In the absence of our own laboratory we have had to get our selections analysed by the Government Industrial

Laboratory at Narayanguda. The Chief Chemist has been very courteous in having our material analysed as promptly as possible. However, the results have practically always come in when the planting for the succeeding season had already been done. This has prevented our basing our selection of single plants and progeny on a high standard of oil. This difficulty will now be obviated as our chemical laboratory has been built and equipped and the Agricultural Chemist has started work in it. Our castor improvement work will consequently move apace and we can hope to raise considerably the standard of oil percentage of our material. But even as it is, a reference to Appendix I Pedigree Chart column (ii) on pages 5 and 8 second item and page 12 second and third items shows, that, we have families, the average oil content of which is 50 per cent. on the whole seed. With better facilities for chemical analyses at hand we can easily increase the percentage by at least two three points before long.

In a nut-shell the position of our improvement activities on the castor crop is such as to make us feel confident about being able to offer to the castor grower of our State in the year 1346 Fasli (1937) at least three to six strains or pure-lines with a high seed-yielding ability and good oil content.





**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernel		
	2	3	4	5	6	7	8	9	10	11	
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Oil Gms. % 378.0 47.59	
2	1338-39 F. 1929-30.	20-13 (65)	do	♀	„ 21	7	210.0	..	..		
3	1339-40 F. 1930-31.	32 (58)	do	♀	„ 22	17	293.0	46.55	64.42		
4	1340-41 F. 1931-32.	349 (10)	do	♀	..	13	1154.0	46.03	73.45		
5	1341-42 F. 1932-33.	539 (37)	Green with	♀	„ 22	16	218.0	49.60	68.40		
6	1342-43 F. 1933-34.	701 (63)	Red with	♀	Nov. 29	4	184.0	48.20	70.00		



**APPENDIX I—contd.**  
***Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F.(1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.***

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appear- ance of the main inflores- cence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernal	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F. <u>1928-29.</u>	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1338-39 F. <u>1929-30.</u>	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1339-40 F. <u>1930-31.</u>	26 (30)	do	$\frac{5}{13} \text{ } \frac{\text{Q}}{\text{?}} : \frac{7}{13} \text{ } \frac{\text{M}}{\text{?}}$	" 22	30	755.0	47.95	65.91	AVERAGE
4	1340-41 F. <u>1931-32.</u>	240 (1)	do	$\frac{11}{17} \text{ } \frac{\text{Q}}{\text{?}} : \frac{6}{17} \text{ } \frac{\text{M}}{\text{?}}$	" 2	9	401.0	49.04	67.39	Oil %
5	1341-42 F. <u>1932-33.</u>	508 (31)	do	♀	" 8	17	484.0	50.10	69.00	Gms.
6	1342-43 F. <u>1933-34.</u>	622 (3)	do	♀	Oct. 6	2	205.0	48.80	68.00	408.16 49.24

1	1887-88 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1928-29.	20-13 (65)	do	♀	" 21	7	210.0	..	..
3	1888-89 F.	32 (45)	do	20/31 ♀ : 11/31 ♂	" 18	29	301.0	47.48	64.92
4	1929-30.	348 (1)	do	♀	..	11	370.0	48.06	69.02
5	1889-40 F.	535 (1)	do	♀	" 19	24	242.0	47.90	67.40
6	1930-31.	639 (72)	do	♀	Oct. 3	14	191.0	49.80	70.10
	1840-41 F.								253.88 45.78
	1931-32.								
	1841-42 F.								
	1932-33.								
	1842-43 F.								
	1933-34.								
1	1887-88 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1928-29.	20-13 (65)	do	♀	" 21	7	21.00	..	..
3	1888-89 F.	32 (45)	do	20/31 ♀ : 11/31 ♂	" 18	29	301.0	47.48	64.92
4	1929-30.	348 (1)	do	♀	..	11	370.0	48.06	69.02
5	1889-40 F.	535 (15)	do	♀	" 24	8	164.0	50.60	72.60
6	1930-31.	641 (68)	do	♀	Oct. 14	4	157.0	46.60	65.00
	1840-41 F.								235.16 48.18
	1931-32.								
	1841-42 F.								
	1932-33.								
	1842-43 F.								
	1933-34.								

APPENDIX I—contd.  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernel		
1	2	3	4	5	6	7	8	9	10	11	12
1	1337-38 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1928-29. 1338-39 F.	20-13 (65)	do	♀	" 21	7	210.0	..	..		
3	1929-30. 1339-40 F.	32 (45)	do	<sup>30</sup> / <sub>31</sub> ♀: <sup>11</sup> / <sub>31</sub> ♂	" 18	29	301.0	47.48	64.92		
4	1930-31. 1340-41 F.	348 (1)	do	♀	..	11	370.0	48.06	69.02	AVERAGE	
5	1931-32. 1341-42 F.	535 (40)	do	♀	Oct. 6	4	150.0	49.00	68.00	Seed Oil	
6	1932-33. 1342-43 F.	642 (1)	do	♀	Sept. 15	16	234.0	50.60	70.00	Gms. %	
	1933-34.									245.66	48.78



**APPENDIX 1—contd.**  
***Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.***

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1338-39 F. 1929-30.	20-13 (48)	do	11/30 ♀: 19/30 ♂	2	9	130.0	..	..		
3	1339-40 F. 1930-31.	227 (65)	do	7/15 ♀: 8/15 ♂	4	51	401.0	46.34	63.71		
4	1340-41 F. 1931-32.	307 (70)	do	♀	9	26	354.0	49.80	67.81		
5	1341-42 F. 1932-33.	528 (41)	do	♀	Dec. 17	3	279.0	46.90	66.10		
6	1342-43 F. 1933-34.	634 (1)	do	♀	..	3	183.0	50.00	69.00	259.33 48.26	







**APPENDIX I—contd.**  
***Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.***

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1838-39 F. 1929-30.	20-13 (65)	do	♀	" 21	7	210.0	..	..		
3	1839-40 F. 1930-31.	32 (45)	do	<sup>20</sup> / <sub>13</sub> ♀ : <sup>11</sup> / <sub>31</sub> ♂	" 18	29	301.0	47.48	64.92	Seed Oil Gms. %	
4	1840-41 F. 1931-32.	348 (1)	do	♀	..	11	370.0	48.06	69.02		
5	1841-42 F. 1932-33.	535 (61)	do	♀	" 23	10	227.0	44.10	64.80		
6	1842-43 F. 1933-34.	647 (81)	do	<sup>17</sup> / <sub>26</sub> ♀ : <sup>9</sup> / <sub>26</sub> ♂	Oct. 4	14	490.0	50.50	70.20	301.16 47.53	

1	1887-88 F.	20 (18) Red with	♀	Sept 13	12	209.0	..	..
2	1928-29. 1888-89 F.	20-13 (65) do	♀	" 21	7	210.0	..	..
3	1929-30. 1889-40 F.	32 (45) do	20/21 ♀ : 11/31 ♂	18	29	301.0	47.48	64.92
4	1930-31. 1840-41 F.	848 (1) do	♀	..	11	370.0	48.06	69.02
5	1931-32. 1841-42 F.	595 (61) do	♀	" 23	10	227.0	44.10	64.80
6	1932-33. 1842-43 F.	647 (37) do	37/46 ♀ : 9/46 ♂	Oct. 5	10	157.0	44.0	64.00
	1933-34.					245.66		45.91

53

1	1937-38 F.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..
2	1928-29. 1938-39 F.	20-13 (48) do	11/30 ♀ : 19/30 ♂	" 2	9	130.0	..	..
3	1929-30. 1839-40 F.	227 (65) do	7/15 ♀ : 8/15 ♂	" 4	51	401.0	46.34	63.71
4	1930-31. 1840 41 F.	807 (70) do	♀	" 9	26	354.0	49.80	67.81
5	1931-32. 1841-42 F.	8 (10) do	♀	" 19	4	103.0	41.50	60.40
6	1932-33. 1842-43 F.	657 (1) do	♀	Dec. 1	0	152.0	48.50	66.00
	1933-34.					224.83		46.38



1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34) do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (37) do	♀	" 16	16	194.0	..	..
4	1340-41 F. 1931-32.	488 (10) do	♀	Nov. 28	5	71.0	50.32	70.53
5	1341-42 F. 1932-33.	576 (4) do	♀	Sept. 24	7	237.0	51.00	70.90
6	1342-43 F. 1933-34.	681 (73) do	♀	Nov. 21	2	163.0	49.30	66.40 219.83 50.21
1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34) do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (37) do	♀	" 16	16	194.0	..	..
4	1340-41 F. 1931-32.	488 (10) do	♀	Nov. 28	5	71.0	50.32	70.53
5	1341-42 F. 1932-33.	576 (8) do	♀	Sept. 14	4	150.0	43.30	64.02
6	1342-43 F. 1933-34.	682 (62) do	♀	Nov. 20	6	247.0	47.40	66.60 219.33 47.81

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1337-38 F. 1938-39.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1338-39 F. 1939-40.	20-13 (48)	do	11/30 ♀:19/30 ♂	" 2	9	130.0	..	..		
3	1339-40 F. 1940-41.	227 (65)	do	7/15 ♀:8/15 ♂	" 4	51	401.0	46.34	63.71	AVERAGE	
4	1340-41 F. 1941-42.	307 (70)	do	♀	" 9	26	354.0	49.80	67.81	Seed Oil %	
5	1341-42 F. 1942-43.	528 (10)	do	♀	" 19	4	103.0	41.50	60.40	Gms.	
6	1342-43 F. 1933-34.	657 (33)	do	2/3 ♀:1/3 ♂	Jan. 12	2	160.0	49.00	66.90	226.16 46.66	



# APPENDIX I—contd.

*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1938-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Oil Gms. % 163.16 46.26
2	1338-39 F. 1929-30.	20-13 (48)	do	$\frac{11}{130} + \frac{19}{130} \sigma^1$	" 2	9	130.0	..	..	
3	1339-40 F. 1930-31.	227 (57)	do	♀	Nov. 25	10	390.0	..	..	
4	1340-41 F. 1931-32.	483 (30)	do	$\frac{6}{19} + \frac{13}{19} \sigma^1$	Dec. 31	1	85.0	51.29	70.58	
5	1341-42 F. 1932-33.	574 (24)	do	♀	" 20	0	70.0	37.70	55.70	
6	1342-43 F. 1933-34.	661 (7)	do	♀	Nov. 23	0	95.0	49.70	67.70	



**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1938-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single- Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appear- ance of the main inflores- cence	No. of Branch Spikes	OIL PER CENT ON			
							Seed in Gms.	Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F. <u>1928-29.</u>	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE
2	1338-39 F. <u>1929-30.</u>	20-13 (34)	do	♀	„ 20	9	445.0	50.23	67.50	
3	1339-40 F. <u>1930-31.</u>	26 (21)	Green with	♀	„ 25	12	318.0	46.27	64.21	
4	1340-41 F. <u>1931-32.</u>	383 (45)	do	♀	..	8	431.0	46.58	64.79	
5	1341-42 F. <u>1932-33.</u>	562 (71)	Red with	♀	Sept. 27	9	152.0	48.60	66.00	
6	1342-43 F. <u>1933-34.</u>	677 (13)	do	♀	Oct. 2	11	153.0	46.40	63.10	284.66 49.42

1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	145.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (37)	do	♀	" 16	16	194.0	..	..
4	1340-41 F. 1931-32.	488 (10)	do	♀	Nov. 28	5	71.0	50.32	70.53
5	1341-42 F. 1932-33.	576 (4)	do	♀	Sept. 24	7	237.0	51.00	70.90
6	1342-43 F. 1933-34.	681 (54)	do	49/57 ♀: 8/57 ♂	Nov. 17	6	160.0	49.30	67.60 219.33 50.21
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (37)	do	♀	" 16	16	194.0	..	..
4	1340-41 F. 1931-32.	488 (10)	do	♀	Nov. 28	5	71.0	50.32	70.53
5	1341-42 F. 1932-33.	576 (4)	do	♀	Sept. 24	7	237.0	51.00	70.90
6	1342-43 F. 1933-34.	681 (62)	do	♀	Nov. 23	2	166.0	51.50	70.90 220.33 50.76

APPENDIX I.—*contd.*

*Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1938-39) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernal	
1	2	3	4	5	6	7	8	9	10	11
1	1937-38 F. 1928-29.	20 (12)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Gms. Oil % 236.66 48.91
2	1938-39 F.	20-13 (34)	do	♀	20	9	445.0	50.23	67.50	
3	1939-40 F. 1929-30.	26 (37)	do	♀	16	16	194.0	..	..	
4	1930-31. 1940-41 F.	488 (10)	do	♀	Nov. 28	5	71.0	50.32	70.53	
5	1941-42 F. 1931-32.	576 (3)	do	♀	Sept. 26	11	331.0	49.20	67.00	
6	1942-43 F. 1932-33. 1933-34.	630 (1)	do	♀	Oct. 11	6	170.0	45.90	63.50	

1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1839-40 F. 1930-31.	26 (37)	do	♀	" 16	16	194.0	..	..
4	1840-41 F. 1931-32.	488 (10)	do	♀	Nov. 28	5	71.0	50.32	70.53
5	1841-42 F. 1932-33.	576 (54)	do	♀	Sept. 24	11	229.0	47.10	65.60
6	1842-43 F. 1933-34.	686 (1)	do	♀	" 22	14	270.0	48.70	67.30 236.83 49.09
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1838-39 F. 1929-30.	20-13 (65)	do	♀	" 21	7	210.0	..	..
3	1839-40 F. 1930-31.	32 (58)	do	♀	" 22	17	293.0	46.55	64.42
4	1840-41 F. 1931-32.	349 (35)	Green with	♀	" ..	9	442.0	48.33	65.89
5	1841-42 F. 1932-33.	545 (70)	do	♀	Oct. 25	16	388.0	49.89	66.89
6	1842-43 F. 1933-34.	704 (49)	do	♀	" 5	13	155.00	42.30	60.70 282.83 46.74

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of themain inflorescence	No. of Branch pikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1837-38 F.	..	..	..	..	..	..	..	..	AVERAGE Seed Oil Gms. %
2	1928-29. 1838-39 F.	..	..	..	..	..	..	..	..	
3	1929-30. 1839-40 F.	..	..	..	..	..	..	..	..	
4	1930-31. 1840-41 F.	..	..	..	..	..	..	..	..	
5	1931-32. 1841-42 F.	..	..	..	..	..	..	..	..	
6	1932-33. 1842-43 F.	770 (3)	Redwith	..	..	6	207.0	47.10	68.70	
	1933-34.									



# APPENDIX I—contd.

*Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1933-34) Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of them in inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1837-38 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Gms. 304.33 Oil % 48.78	
2	1928-29. 1838-39 F.	20-13 (65)	do	♀	" 21	7	210.0	..	..		
3	1929-30. 1839-40 F.	32 (58)	do	♀	" 22	17	293.0	46.55	64.42		
4	1930-31. 1840-41 F.	349 (40)	do	♀	..	4	252.0	51.39	70.69		
5	1931-32. 1841-42 F.	M546 (27)	do	♀	" 29	10	272.0	..	..		
6	1932-33. 1842-43 F.	M103 (47)	do	♀	Oct. 3	18	590.0	48.30	67.00		
	1933-34.										

1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	do	♀	" 21	7	210.0	..	..
3	1339-40 F. 1930-31.	32 (58)	♀	" 22	17	298.0	46.55	64.42
4	1340-41 F. 1931-32.	349 (40)	♀	..	4	252.0	51.39	70.69
5	1341-42 F. 1932-33.	M546 (27)	♀	" 29	10	272.0	..	..
6	1342-43 F. 1933-34.	M108 (65)	♀	Oct. 8	20	1355.0	48.40	66.70 431.83 48.78
1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (52) Green with	♀	" 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	382 (9)	♀	..	3	407.0	48.29	65.57
5	1341-42 F. 1932-33.	554 (1)	♀	" 9	17	297.0	50.50	69.90
6	1342-43 F. 1933-34.	710 (62)	♀	Oct. 14	8	180.0	47.40	69.70 310.16 48.89

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks	
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms	OIL PER CENT ON			
								Whole Seed	Kernel		
1	2	3	4	5	6	7	8	9	10	11	
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	20	9	445.0	50.23	67.50		
3	1839-40 F. 1930-31.	26 (64)	Green	♀	25	10	257.5	46.83	64.52		
4	1840-41 F. 1931-32.	374 (51)	d	♀	18	8	250.0	47.18	64.59	AVERAGE Seed Gms.	Oil %
5	1841-42 F. 1932-33.	552 (1)	ew	♀	24	10	448.0	46.50	67.10		
6	1842-43 F. 1933-34.	705 (70)	do	$\frac{2}{3}$ ♀: $\frac{1}{3}$ ♂	20	14	170.0	44.30	62.50	263.25	47.01

1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (52)	Green	♀	" 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	382 (9)	with do	♀	..	2	407.0	48.29	65.57
5	1341-42 F. 1932-33.	554 (3)	do	♀	" 24	6	233.0	50.10	68.00
6	1342-43 F. 1933-34.	711 (60)	do	♀	Oct. 11	3	97.0	45.50	64.20
							285.66		48.49
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (52)	Green	♀	" 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	382 (51)	with do	♀	..	4	513.0	50.58	69.37
5	1341-42 F. 1932-33.	555 (2)	do	♀	" 29	9	233.0	49.60	68.70
6	1342-43 F. 1933-34.	712 (47)	do	♀	14Nov.	5	90.0	46.30	65.20
							290.66		47.80





APPENDIX I—contd.

*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	PLANT CHARACTERS				SEED AND OIL				Remarks
		Single Plant Selection and its Pedigree	Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	OIL PER CENT ON		Kernel	
							Seed in Gms.	Whole Seed		
1	2	3	4	5	6	7	8	9	10	11
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Oil Gms. % 274.00 48.29
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1839-40 F. 1930-31.	26 (21)	Green with	♀	" 25	2	518.0	46.27	67.40	
4	1840-41 F. 1931-32.	383 (33)	do	♀	..	7	348.0	47.50	64.63	
5	1841-42 F. 1932-33.	560 (1)	do	♀	Oct. 1	11	150.0	49.70	68.30	
6	1842-43 F. 1933-34.	714 (1)	do	♀	..	10	174.0	47.70	66.20	

1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 18	12	209.0	..	..
2	1338-39 F. 1929-30.	do	♀	.. 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	Green with	♀	.. 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	do	♀	..	8	407.0	48.29	65.57
5	1341-42 F. 1932-33.	do	♀	.. 24	6	233.0	50.10	68.00
6	1342-43 F. 1933-34.	do	$\frac{9}{13} \text{♀} : \frac{4}{13} \text{♂}$	Oct. 4	22	528.0	50.50	69.10 357.50 49.43
1	1337-38 F. 1928-29.	20 (13) Red with	♀	Sept. 18	12	209.0	..	..
2	1338-39 F. 1929-30.	do	♀	.. 20	9	445.0	60.23	67.50
3	1339-40 F. 1930-31.	do	♀	.. 16	19	471.5	46.24	65.57
4	1340-41 F. 1931-32.	do	♀	..	8	329.0	48.55	68.64
5	1341-42 F. 1932-33.	..	♀	..	15	535.0	..	..
6	1342-43 F. 1933-34.	M10 (79)	♀	.. 30	12	350.0	45.60	63.80 389.91 47.65

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernal	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE  Seed Oil Gms. % 275.50 48.18
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1339-40 F. 1930-31.	26 (21)	Green with	♀	" 25	13	318.0	46.27	64.21	
4	1340-41 F. 1931-32.	383 (33)	do	♀	..	7	348.0	47.58	64.63	
5	1341-42 F. 1932-33.	560 (1)	do	♀	Oct. 1	11	150.0	49.70	68.30	
6	1342-43 F. 1933-34.	714 (4)	do	♀	" 11	5	183.0	47.10	64.40	



**APPENDIX 1—*contd.***  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Oil Seed % Gms.
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1839-40 F. 1930-31.	26 (21)	Green with	♀	Sept. 25	13	318.0	46.27	64.21	
4	1840-41 F. 1931-32.	383 (33)	do	♀	..	7	348.0	47.58	64.63	
5	1841-42 F. 1932-33.	560 (4)	do	♀	Oct. 1	11	150.0	49.70	68.30	
6	1842-43 F. 1933-34.	714 (15)	do	♀	Sept. 29	13	287.0	46.40	63.80	



**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1933-34) Showing Important Plant Characters Yield of Seed and Oil Per cent.*

Seed and Oil Per cent.										
Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms	OIL PER CENT ON		
								Whole Seed	Kernal	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Oil Seed Gms. %
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	69.50	
3	1339-40 F. 1930-31.	26 (21)	Green with	♀	" 25	18	318.0	46.27	64.21	
4	1340-41 F. 1931-32.	383 (45)	do	♀	..	8	431.0	46.58	64.79	
5	1341-42 F. 1932-33.	562 (1)	do	♀	" 19	11	179.0	52.20	71.30	
6	1342-43 F. 1933-34.	717 (5)	..	<sup>24</sup> / <sub>41</sub> ♀: <sup>17</sup> / <sub>41</sub> ♂	Oct. 5	12	285.0	50.40	69.10	

1	1937-38 F.	20 (18) Red with	♀	Sept. 13	12	209.0	..	..	
2	1928-29. 1938-39 F.	do	♀	" 20	9	445.0	50.23	67.50	
3	1929-30. 1939-40 F.	Green	♀	" 25	13	318.0	46.27	64.21	
4	1930-31. 1940-41 F.	do	♀	..	8	431.0	46.58	64.79	
5	1931-32. 1941-42 F.	do	♀	" 17	7	190.0	47.40	66.00	
6	1932-33. 1942-43 F.	..	$14/_{23}♀ + :^9/_{23}♂$	Nov. 23	10	250.0	50.00	70.00	307.16 48.10
1	1937-38 F.	20 (18) Red with	♀	Sept. 13	12	209.0	..	..	
2	1928-29. 1938-39 F.	do	♀	" 21	7	210.0	..	..	
3	1929-30. 1939-40 F.	do	♀	" 22	17	293.0	46.55	64.42	
4	1930-31. 1940-41 F.	do	♀	..	8	442.0	48.33	65.89	
5	1931-32. 1941-42 F.	..	♀	Oct. 25	15	388.0	49.80	66.80	
6	1932-33. 1942-43 F.	..	$19/_{25} + :^6/_{25}♂$	" 1	6	260.0	50.00	66.30	300.33 48.67
	1933-34.								



1	1337-38 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
	1928-29.	20-13 (34)	do	♀	..	9	445.0	50.23	67.50
2	1338-39 F.	26 (21)	Green	♀	..	13	318.0	46.27	64.21
	1929-30.	383 (45)	with do	♀	..	7	431.0	46.58	64.79
3	1339-40 F.	562 (4)	do	♀	..	7	190.0	47.40	66.00
	1930-31.	718 (17)	do	♀	Nov. 20	3	151.0	48.50	68.40
4	1340-41 F.								290.66
5	1341-42 F.								47.80
	1931-32.								
6	1342-43 F.								
	1932-33.								
	1933-34.								

1	1337-38 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
	1928-29.	20-13 (34)	do	♀	..	9	445.0	50.23	67.50
2	1338-39 F.	26 (21)	Green	♀	..	13	318.0	46.27	64.21
	1929-30.	383 (45)	with do	♀	..	7	431.0	46.58	64.79
3	1339-40 F.	562 (58)	do	♀	Oct. 4	5	153.0	47.90	65.60
	1930-31.	724 (35)	do	♀	..	6	157.0	50.00	67.80
4	1340-41 F.								285.5
5	1341-42 F.								48.20
	1931-32.								
6	1342-43 F.								
	1932-33.								
	1933-34.								

$15/23 \text{ ♀} + 5/23 \text{ ♂}$



1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 18	12	209.0	..	..	
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1339-40 F. 1930-31.	26 (21)	Green with	♀	" 25	13	313.0	46.27	64.21	
4	1340-41 F. 1931-32.	383 (38)	do	♀	..	7	343.0	47.58	64.63	
5	1341-42 F. 1932-33.	560 (3)	do	♀	Oct. 3	9	334.0	..	..	
6	1342-43 F. 1933-34.	M31 (1)	do	♀	" 1	16	125.0	47.30	65.5	379.66 47.84
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1338-39 F. 1929-30.	20-13 (32)	do	♀	" 21	6	209.0	..	..	
3	1339-40 F. 1930-31.	25 (68)	do	$\frac{1}{2}\Omega^1/\frac{1}{2}\Omega^2$	" 23	0	323.0	48.51	66.22	
4	1340-41 F. 1931-32.	419 (23)	do	♀	..	4	402.0	48.25	64.10	
5	1341-42 F. 1932-33.	568 (63)	do	♀	Dec. 12	0	54.0	45.00	67.82	
6	1342-43 F. 1933-34.	659 (44)	do	♀	Nov. 18	0	50.0	48.20	69.50	207.33 47.49

**APPENDIX I—contd.**  
***Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1938-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.***

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1337-38 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1928-29.	20-13 (34)	do	♀	.. 20	9	445.0	60.23	67.50	
3	1338-39 F.	26 (21)	Green with	♀	.. 25	13	318.0	46.27	64.21	
4	1929-30.	383 (45)	do	♀	..	7	431.0	46.58	64.79	AVERAGE
5	1339-40 F.	562 (17)	do	♀	.. 12	7	184.0	49.10	67.90	Seed Oil Gms. %
6	1930-31.	727 (73)	do	♀	Oct. 10	5	154.0	49.00	67.10	290.16 48.23
	1340-41 F.									
	1931-32.									
	1341-42 F.									
	1932-33.									
	1342-43 F.									
	1933-34.									



**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-48 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Sl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1887-88 F.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1928-29. 1888-89 F.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50		
3	1929-30. 1889-40 F.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52		
4	1930-31. 1840-41 F.	374 (51)	do	♀	" 18	8	250.0	47.18	64.59		AVERAGE Oil %
5	1931-32. 1841-42 F.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10		
6	1932-33. 1842-43 F.	705 (43)	do	♀	Oct. 5	4	165.0	44.50	60.70	262.33	47.05
	1933-34.										



**APPENDIX I—contd.**  
**Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.**

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL					Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms	OIL PER CENT ON				
								Whole Seed	Kernel			
1	2	3	4	5	6	7	8	9	10	11		
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..			
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50			
3	1339-40 F. 1930-31.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52	AVERAGE	Oil	
4	1340-41 F. 1931-32.	374 (51)	do	♀	" 18	8	250.0	47.15	64.59	Seed Gms.	%	
5	1341-42 F. 1932-33.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10			
6	1342-43 F. 1933-34.	705 (27)	do	♀	Oct. 16	2	104.0	45.20	65.40	252.25	47.19	



## APPENDIX I—contd.

*Pedigree Chart of Castor Single-Plant Selections Planted in 1942-43 F. (1988-84) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

[illegible]



**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	PLANT CHARACTERS					SEED AND OIL				Remarks
		Single-Plant Selection and its Pedigree	Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernel		
1	2	3	4	5	6	7	8	9	10	11	
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	20	9	445.0	50.23	67.50		
3	1839-40 F. 1930-31.	26 (64)	Green with	♀	25	10	257.5	46.83	64.52	AVERAGE Seed Gms.	
4	1840-41 F. 1931-32.	374 (51)	do	♀	18	8	250.0	47.18	64.59	Oil %	
5	1841-42 F. 1932-33.	252 (1)	do	♀	24	10	248.0	46.50	67.10		
6	1842-43 F. 1933-34.	705 (41)	Red with	$\frac{2}{1} \frac{Q}{F} \frac{1}{4} \frac{\sigma}{\delta}$	Oct. 9	8	212.0	50.10	70.40	270.25 48.17	

1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	"	9	445.0	50.23	67.50	
3	1339-40 F. 1930-31.	26 (64)	Green with	♀	"	10	257.5	46.83	64.52	
4	1340-41 F. 1931-32.	374 (51)	do	♀	"	8	250.0	47.18	64.59	
5	1341-42 F. 1932-33.	552 (1)	do	♀	"	10	248.0	46.50	67.01	
6	1342-43 F. 1933-34.	705 (57)	Red with	11/24 ♀: 13/24 ♂	Oct. 4	11	304.0	50.00	70.20	285.59 48.15
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	"	9	445.0	50.23	67.50	
3	1339-40 F. 1930-31.	26 (64)	Green with	♀	"	10	257.5	46.83	64.52	
4	1340-41 F. 1931-32.	374 (51)	do	♀	"	8	250.0	47.18	64.59	
5	1341-42 F. 1932-33.	552 (1)	do	♀	"	10	248.0	46.50	67.10	
6	1342-43 F. 1933-34.	705 (26)	Red with	♀	Oct. 11	4	210.0	45.00	66.00	269.91 47.15

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1887-88 F. 1928-29.	20 (13)	Red with	♀	Sept. 18	12	209.0	..	..		
2	1888-89 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50		
3	1889-90 F. 1930-30.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52		
4	1840-41 F. 1931-32.	374 (51)	do	♀	" 18	8	250.0	47.18	64.59	AVERAGE	
5	1841-42 F. 1932-33.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10	Seed Gms. %	
6	1842-43 F. 1933-34.	705 (33)	do	♀	Oct. 3	4	194.0	50.00	70.00	267.25 48.15	



**APPENDIX I—contd.**  
*Pedigree Chart of Custor Single-Plant Selections Planted in 1842-48 F. (1933-84) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL			Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON		
								Whole Seed	Kernel	
1	2	3	4	5	6	7	8	9	10	11
1	1837-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1838-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50	
3	1839-40 F. 1930-31.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52	
4	1340-41 F. 1931-32.	374 (51)	do	♀	" 18	8	250.0	47.18	64.59	AVERAGE
5	1341-42 F. 1932-33.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10	Seed Oil %
6	1342-43 F. 1933-34.	705 (54)	do	♀	Oct. 8	4	157.0	45.70	63.60	261.08 47.29

1	1887-88 F.	20 (18)	Red with	♀	Sept. 13	12	209.0	..	..
2	1928-29. 1888-89 F.	20-18 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1929-30. 1889-40 F.	26 (64)	Green with	♀	" 25	10	25.7	46.83	64.52
4	1930-31. 1840-41 F.	374 (51)	do	♀	" 18	8	250.0	47.18	64.59
5	1981-82. 1841-42 F.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10
6	1982-83. 1842-43 F.	705 (67)	do	♀	Oct. 14	2	150.0	41.90	259.66 46.53
1	1887-88 F.	20 (18)	Red with	♀	Sept. 13	12	209.0	..	..
2	1928-29. 1888-89 F.	20-18 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1929-30. 1889-40 F.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52
4	1930-31. 1840-41 F.	374 (51)	do	♀	" 18	8	250.0	47.18	64.59
5	1981-82. 1841-42 F.	552 (1)	do	♀	" 24	10	248.0	46.50	67.10
6	1982-83. 1842-43 F.	705 (20)	do	♀	Oct. 8	4	153.0	46.00	63.20 260.41 47.35



1	1837-38 F.	20 (18) Red with	♀	Sept. 13	12	209.0	..	..	
2	1928-29. 1838-39 F.	20-13 (65) do	♀	" 21	7	210.0	..	..	
3	1929-30. 1839-40 F.	32 (58) do	♀	" 22	17	293.0	46.55	64.42	
4	1930-31. 1840-41 F.	349 (40) do	♀	..	1	252.0	51.39	70.69	
5	1931-32. 1841-42 F.	M 546 (27) do	♀	" 29	10	272.0	..	..	
6	1932-33. 1842-43 F.	M 103 (27) do	♀	" 28	14	755.0	48.90	66.80	381.16 48.95
1	1837-38 F.	20 (13) Red with	♀	Sept. 13	12	209.0	..	..	
2	1928-29. 1838-39 F.	20-13 (65) do	♀	" 21	7	210.0	..	..	
3	1929-30. 1839-40 F.	32 (58) do	♀	" 22	17	293.0	46.55	64.42	
4	1930-32. 1840-41 F.	349 (40) do	♀	..	4	252.0	51.39	70.69	
5	1931-32. 1841-42 F.	M 546 (27) do	♀	" 29	10	272.0	..	..	
6	1932-33. 1842-43 F.	M 103 (32) do	♀	Oct. 3	17	595.0	48.60	66.50	305.16 48.85
	1933-34.								



1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (52)	Green with	♀	" 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	382 (9)	do	♀	..	3	407.0	48.29	65.57
5	1341-42 F. 1932-33.	554 (3)	do	♀	" 24	7	233.0	50.10	68.00
6	1342-43 F. 1933-34.	711 (62)	do	♀	Oct. 18	6	257.0	51.00	70.60
							812.33	49.53	
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50
3	1339-40 F. 1930-31.	26 (52)	Green with	♀	" 20	8	323.0	48.02	65.68
4	1340-41 F. 1931-32.	382 (9)	do	♀	..	3	407.0	48.29	65.57
5	1341-42 F. 1932-33.	554 (3)	do	♀	" 24	7	233.0	50.10	68.00
6	1342-43 F. 1933-34.	711 (63)	do	♀	Oct. 22	6	257.0	40.60	68.70
							312.33	49.25	

**APPENDIX I—contd.**  
*Pedigree Chart of Castor Single-Plant Selections Planted in 1842-43 F. (1933-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernal		
1	2	3	4	5	6	7	8	9	10	11	
1	1337-38 F. 1928-20.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	AVERAGE Seed Gms. Oil %	
2	1338-39 F. 1929-30.	20-13 (34)	do	♀	" 20	9	445.0	50.23	67.50		
3	1339-40 F. 1930-31.	26 (64)	Green with	♀	" 25	10	257.5	46.83	64.52		
4	1340-41 F. 1931-32.	374 (51)	do	♀	" 18	8	250.0	46.81	64.59		
5	1341-42 F. 1932-33.	552 (1)	do	♀	" 24	9	248.0	46.50	67.10		
6	1342-43 F. 1933-34	705 (43)	do	17/25 ♂ / 9/25 ♂	Oct. 5	7	165.0	48.60	66.10		262.41 47.79

1	1937-38 F. 1938-39.	7 (4)	Green with do	♀	Sept. 13	12	209.0	..	..	
2	1938-39 F. 1939-40.	7-4 (1)	do	♀	..	..	..	..	..	
3	1939-40 F. 1940-41.	143 (15)	do	♀	Feb. 22	0	25.0	45.00	64.17	
4	1940-41 F. 1941-42.	459 (26)	do	♀	„ 19	0	92.0	49.91	65.67	
5	1941-42 F. 1942-43.	T591 (1)	do	♀	Dec. 13	7	503.0	49.70	64.00	
6	1942-43 F. 1943-44.	T758 (16)	do	♀	..	..	..	..	..	207.25 48.20
1	1937-38 F. 1938-39.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..	
2	1938-39 F. 1939-40.	20-13 (65)	do	♀	„ 21	7	210.0	..	..	
3	1939-40 F. 1940-41.	82 (45)	do	20/31 ♀: 11/31 ♂	„ 18	29	301.0	47.48	64.92	
4	1940-41 F. 1941-42.	848 (1)	do	♀	..	11	370.0	49.69	69.02	
5	1941-42 F. 1942-43.	585 (61)	do	♀	„ 23	10	227.0	44.10	64.80	
6	1942-43 F. 1943-44.	647 (7)	do	♀	Oct. 5	7	160.0	49.10	70.10	246.16 47.57

APPENDIX I—*contd.*

*Pedigree Chart of Castor Single-Plant Selections Planted in 1342-43 F. (1938-34) Showing Important Plant Characters, Yield of Seed and Oil Per cent.*

Srl. No.	Crop Year	Single-Plant Selection and its Pedigree	PLANT CHARACTERS				SEED AND OIL				Remarks
			Plant Colour and Bloom	Nature of the Main Spike	Date of appearance of the main inflorescence	No. of Branch Spikes	Seed in Gms.	OIL PER CENT ON			
								Whole Seed	Kernel		
1	2	3	4	5	6	7	8	9	10	11	
1	1337-38 F. 1928-29.	20 (13)	Red with	♀	Sept. 13	12	209.0	..	..		
2	1338-39 F. 1929-30.	20-13 (48)	do	11/30 ♀: 13/30 ♂	" 2	9	130.0	..	..		
3	1339-40 F. 1930-31.	227 (57)	do	♀	Nov. 25	10	390.0	..	..		
4	1340-41 F. 1931-32.	483 (30)	do	9/19 ♀: 13/19 ♂	Dec. 31	1	85.0	57.29	70.58		AVERAGE Seed Gms. Oil %
5	1341-42 F. 1932-33.	574 (24)	do	♀	" 20	0	70.0	37.70	55.70		
6	1342-43 F. 1933-34.	199 (67)	do	♀	Nov. 29	0	65.0	46.50	66.50	158.16	45.16



## KHARIF JOWAR IMPROVEMENT.

Farm plots C8, C9 and C10 (in part) were used. The planting was done on Amerdad 14, 1342 F., (June 19, 1933), the plots having been previously prepared as usual by being ploughed deep once, cleaned of trash and *bakhared* five times on an average. No manure was given to any of the plots.

The seed in all cases was graded and selected and treated with sulphur dust to prevent smut attack later. As in the past, iron dibblers were used for sowing and two seeds were dibbled per hill. The rows ran north-south and plants in the row were east-west as is usually done for *kharif* crops.

The seed in all cases was graded and selected and were

1. Ramkhel
2. Saoner
3. Varadi
4. Alaspuri
5. Godgharya
6. Nanded White
- and 7. Nanded Yellow

Detailed studies were made on these varieties, or rather on two single-plant selections of each variety. Seed of each of the two selections of every variety was sown separately in a row consisting of 100 hills. The final stand in this study was poor. Statement No. I given below shows a year-to-year comparison for four years between the per plant yield of the various families or varieties to which these selections belonged.

[Statement.

*Statement I.*

*Showing seasonal variation in average grain yield of families of Kharif Jowar at the Main Agricultural Experiment Station, Parbhani, for the period 1338-39 F. to 1342-43 F.*

No.	Season	GRAIN YIELDS OF FAMILIES				Remarks
		Ramkhel	Saoner	Varadi	Nanded, White	
1	2	3	4	5	6	7
		Grams	Grams	Grams	Grams	
1	1338-39 F. ..	130.1	153.4	146.6	148.9	
2	1339-40 F. ..	72.0	76.5	67.7	29.9	
3	1340-41 F. ..	24.5	22.4	22.5	30.6	
4	1341-42 F. ..	62.9	60.3	57.5	63.3	
5	1342-43 F. ..	41.9	57.6	41.5	55.6	

The average of these seasonal averages for Ramkhel, Saoner, Varadi and Nanded White respectively for the five seasons 1338-39 F.—1342-43 F. are as under:—

Ramkhel	..	..	66.3 Grams.
Saoner	..	..	74.0 „
Varadi	..	..	67.2 „
Nanded White	..	..	65.7 „

A similar comparison of these families for a period of three years, namely, 1340-41 F.—1342-43 F. gives the following combined averages:—

Ramkhel	..	..	43.1 Grams.
Saoner	..	..	46.8 „
Varadi	..	..	40.5 „
Nanded White	..	..	49.3 „

These same varieties were also planted on a large scale in plots of 4 *gunthas*, each with the Dharwar three-coultered seed-drill in plot C8 on Amerdad 21, 1342 F. (June 26, 1933). The results of yield are given below in Statement II. The figures are for the three seasons 1340-41 F.—1342-43 F.

### Statement II.

*Statement showing the seasonal variation in the grain yield of varieties of Kharif Jowar at the Main Agricultural Experiment Station, Parbhani, from 1340-41 F. to 1342-43 Fashi.*

No.	Season	PER ACRE GRAIN YIELDS OF FAMILIES				Remarks
		Ramkhel	Saoner	Varadi	Nanded White	
	Three-year average.	1,466	1,107	1,215	1,062	
1	2	3	4	5	6	7
		lbs.	lbs.	lbs.	lbs.	
1	1340-41 F. ..	640	552	450	270	
2	1341-42 F. ..	1,858	1,429	1,635	1,635	
3	1342-43 F. ..	1,960	1,340	1,560	1,280	

### RABI JOWAR IMPROVEMENT.

This work was originally started by the present writer as Assistant Economic Botanist in the year 1336 F. at the Mehboob Bag Farm, Parbhani. Two field selections were then made from a standing crop of *Dagdi* or *Sufid* (White) *Rabi* jowar on the farm. The next season the seed of each of these two plants was sown separately and the progeny were found to break up into three distinct kinds, *viz.*, standard (normally tall plants), intermediate and dwarf. Selection work has been continued ever since and at present there are ten families of which at least two are pure dwarves.

Statement III given below shows in a concise form the result of five years' selection work in *Rabi* jowar (*Dagdi*) strains derived from the two original individual plants selected in 1336-37 F. from a field of "*sufid*" or "*Dagdi*" jowar and called K1 and K2 respectively.

*Statement III.*

Showing year to year average grain yields in grams of ten families of *Dagdi* jowar (K selections) for the five year period (1338-39 F.—1342-43 F.—1930-31—1933-34).

No.	Family	SEASON.					Re- marks
		1338-39 F.	1339-40 F.	1340-41 F.	1341-42 F.	1342-43 F.	
		1929-30	1930-31	1931-32	1932-33	1933-34	
1	2	3	4	5	6	7	8
		Grams	Grams	Grams	Grams	Grams	
1	I ..	42.6	22.1	29.8	43.8	18.4	
2	II ..	60.5	28.0	28.6	43.6	20.0	
3	III ..	64.3	24.8	26.7	48.5	22.6	
4	IV ..	58.4	21.9	31.0	47.1	23.2	
5	V ..	64.1	26.6	31.4	49.8	27.5	
6	VI ..	56.6	26.2	29.5	45.5	29.4	
7	VII ..	53.6	27.8	23.6	44.7	35.0	
8	VIII ..	56.3	26.3	31.9	43.7	40.7	
9	IX ..	56.2	24.4	38.4	49.2	53.3	
10	X ..	52.3	22.9	32.0	43.9	54.0	

Besides these *Dagdi* selections twenty-five *Rabi* jowar strains were also studied as in the past years. These were the progeny of fifty samples of jowar, which had been collected from several districts of our State and studied at the Mehboob Bag Farm at Parbhani in 1338-39 F. From time to time several of these were eliminated so that 25 have been left now. Statement IV below presents the individual results in per plant grain yield of these families for the three-year period—1340-41 F. —1342-43 F. (1931-32—1933-34).

Besides these *Dagdi* selections 25 jowar strains were also studied in the rabi as in the past years. These were the progeny of 50 varieties of jowar, which had been collected and studied at Parbhani in the crop-year 1338-39 F. In the course of time only half of these have been retained and the rest discarded. Statement IV below gives at a glance the results of several years' selection work on these Hyderabad varieties.

## STATEMENT IV.

*Showing average per plant grain yields in grams of twenty-five Rabi Jowar Families for the three-year period 1340-41 F.—1342-43 F. 1931-32—1933-34.*

No.	Family	AVERAGE GRAIN YIELD IN THE YEAR			Remarks
		1340-41 F.	1341-42 F.	1342-43 F.	
		1931-32	1932-33	1933-34	
1	2	3	4	5	6
		Grams	Grams	Grams	
1	Hyderabad 1 ..	26.8	42.4	28.4	
2	Do 2 ..	26.5	42.2	38.0	
3	Do 4 ..	22.2	44.8	33.1	
4	Do 5 ..	26.8	49.5	35.3	
5	Do 7 ..	26.5	39.4	26.5	
6	Do 12 ..	23.9	48.5	39.3	
7	Do 13 ..	23.1	41.0	39.2	
8	Do 14 ..	32.5	44.6	32.1	
9	Do 15 ..	31.2	54.6	46.7	
10	Do 21 ..	19.3	40.6	35.5	
11	Do 22 ..	14.5	36.1	31.1	
12	Do 25 ..	23.1	43.7	42.3	
13	Do 26 ..	20.7	51.0	37.0	
14	Do 30 ..	20.8	45.5	40.6	
15	Do 31 ..	20.0	50.1	37.3	
16	Do 32 ..	26.6	56.0	37.4	
17	Do 33 ..	22.8	45.8	26.0	
18	Do 34 ..	19.6	42.9	28.3	
19	Do 35 ..	23.2	57.1	44.9	
20	Do 39 ..	25.6	48.9	47.2	
21	Do 41 ..	18.3	43.7	34.5	
22	Do 42 ..	34.1	40.2	41.5	
23	Do 47 ..	32.9	40.0	49.5	
24	Do 48 ..	28.7	43.6	36.2	
25	Do 50 ..	36.4	37.4	46-2	

## WHEAT IMPROVEMENT AT THE MAIN FARM, PARBHANI.

Work on the improvement of this crop was started in the *Rabi* of 1337 F., when 163 samples of wheat were collected from the various Mahrathwada districts of the State and planted at the Mehboob Farm, Parbhani. The samples were thoroughly studied and purified regarding various characters, such as awn colour, chaff colour, grain colour, presence or absence of awns, etc., by Mr. A. B. H. Koorshid, who was then Assistant Economic Botanist. Several high yielding individual plant selections were made. These and also a large number of fresh samples from the standing crop of cultivators were sown the next season and studied similarly. On the transfer of Mr. Koorshid to Himayet Sagar, the work was taken over by Mr. V. R. Biderkar, on whose passing over to the Cotton Research Work of the Indian Central Cotton Committee in 1340 F., it was entrusted to Mr. M. S. Pawar, who has been conducting it to date.

As has already been mentioned the *rabi* season was not bad, in fact it was good for wheat both as regards the moisture and the cold.

Strain No. Ar. 472 A-10, which appeared to be less susceptible to rust last year, was planted in eleven replications with Pusa 4 and several other strains in order to test its relative resistance. Five irrigations were given during the season. A severe attack of rust broke out in early January. All except Ar. 472 A-10 and Pusa 4 succumbed. Pustules did appear on the stems and leaves of both, but the attack was not severe.

In the coming seasons Ar. 472 A-10 will be tried out thoroughly under rust-inducing conditions to gauge its measure of resistance. Unless we have tested out a strain over a number of years we cannot be certain about its more or less susceptibility. The strain otherwise is good. The grain is hard, yellow, lustrous, elongated and fairly plump. The chaff is white and very hairy. It has, however, a drawback in that it is late-maturing, almost a five-month crop, and, hence, rather unsuitable for dry cultivation. It has been crossed with Bom. 224, an early ripening strain, and 79 seeds obtained as a result. They will be sown and studied next year.

The seed of 99 single-plant selections of the previous year was sown in duplicate sets. The rows were 13' long and spaced  $1\frac{1}{2}$ ' apart. The distance between the hills was 4". The crop grew quite satisfactorily. There was a fair attack of rust in the month of Isfandar (January) but the seed escaped being affected adversely. On the basis of flowering time, final stand, per plant grain yield and the weight of 1,000 seeds 32 out of these 99 strains have been retained and their behaviour regarding all these characters is shown in Table I attached.

Fresh village samples were acquired last year from the districts of Bir and Gulberga and sown on the Main Agricultural Experiment Station, Parbhani. The Gulberga samples showed very poor germination and as a result no desirable individual plants could be selected for the coming year. The Bir samples, however, behaved satisfactorily and as many as 32 single plants were selected in the field as being good. But only 9 of these were retained when the yields had been recorded in the laboratory. Besides these, 15 single-plant selections were taken from the local *Bansi*, grown by the Main Farm, as promising. Thus 24 new single-plant selections will be tried out next year. The yields and other characters of these 24 are shown in the appended Table II.

Table III (attached) shows at a glance the performance of 15 of the best pure-lines of wheat, that are under trial at Parbhani, over a period of four years. The average stand for the four years 1339-40 F.—1342-43 F. (1930-31—1933-34) (Column 7) is quite fair being at least round 60 with 4 out of 15 of the pure-lines being well above that mark and 12 exceeding it more or less. Column 12 of the Table shows the average grain yield per plant for the same period for each of the 15 lines. We notice that they are all above 4.0 grams; 6 of them are above 4.5 grams and 2 above 5.0 grams, whereas the rest range between 4.3 to 4.9 grams of grain. The combined results over the four seasons for each of the 15 pure-lines are shown in column 18. Here, we see that Oosmanabad 72-4 stands first in the order of merit and Aurangabad 12-3 last.

#### WHEAT IMPROVEMENT AT THE MAIN FARM, HIMAYETSAGAR.

There are splendid facilities for irrigation at Himayet Sagar. This fact affords a very good opportunity

for thoroughly testing out the rust-susceptibility of the strains isolated at Parbhani, where the wheat improvement work of our Department is being carried on. Besides, there are 12,000 odd acres of wheat grown annually in the seven Telingana Districts of our State, giving an approximate produce of 1,400 odd tons. This wheat is supposed to be largely irrigated wheat grown in tank-beds and under wells in the *rabi*. Hence, from the very inception of the Botanical section, some wheat work has been done at Himayet Sagar. However, the problem studied is essentially that of rust-resistance. Practically all the strains grown are from Parbhani and are tried out for their resisting quality. Similarly, in the *rabi* of the year under report, the following fifteen strains or pure-lines from the Parbhani Branch were sown and studied.

1. Ar. 12-3
2. C.P. 137-7
3. Ar. 467A-82
4. Osm. 115-3
5. Osm. 85-1
6. Osm. 119-4
7. Bd. 504A-32
8. Osm. 64-4
9. Osm. 69-4
10. Osm. 83-4
11. Osm. 104-4
12. C.P. 137-7
13. Osm. 69-4
14. Pusa 4
15. Pusa 111

Farm plot 82 was ploughed once in the summer and seeded to *sunna* hemp on Shehriwar 18, 1342 F. The *sunna* was ploughed in from Aban 16-18, 1342 F. The land was then irrigated, ploughed and *backhered* and the cultipacker run over it between Azoor 5, and Dai 8, 1343 F., on which latter date the planting was done and continued for another two days.

Besides the above noted strains the progeny of 15 crosses, also from Parbhani, were sown for nothing their rust-resistance or otherwise. Pusa 4 and the old 38, (originally supposed to be resistant to rust, but which in succeeding seasons has proved to be decidedly susceptible), were also planted.

Immediately the land was irrigated and during the season five more irrigations were given, making a total of six. Rust made its appearance on the leaves on Isfandar 20, 1343 F. and was general and profuse by Farwardi 5. In fact the attack was so severe that the entire wheat crop proved like a complete failure, the rust penetrating the glumes and appearing on the grain itself. The grain was all very badly shrivelled.

Strain Ar. 472 A-10, which was found to be resistant at Parbhani, was also planted in a plot by itself, the plot measuring 33'×18'. This strain was also badly affected by rust. But the grain was not much affected in that it was not much shrivelled. This year's operations show that all the strains of wheat grown were rust-susceptible. This includes Pusa 4, Pusa 111 and 38.

Three new strains of *vulgare* wheat were obtained from the United States through the courtesy of Mr. B. D. Lieth, Professor of Agronomy, College of Agriculture, University of Wisconsin, and sown in the previous year under the numbers W 1, W 2 and W 3. Seed obtained from W 1 and W 3 were sown this year. The latter germinated well and was irrigated five times in the season. Planted on Dai 25, 1343 F., it did not entirely escape the disease, rust, but was only slightly affected; it grew well and produced plump grain, somewhat like that of Pusa 4. It was harvested on Ardibehisht 4, that is, just 3 $\frac{3}{4}$  months after planting. It will be again tried out this season. In Hyderabad W 3 evidently needs more moisture and *turns to an irrigated crop*.

(Sd.) A. B. H. KHOORSHID,

*Economic Botanist to*

*H.E.H. the Nizam's Government.*

TABLE I.

*Showing the per cent. final stand, average grain yield, etc. of 32 strains of wheat grown in the year 1342-43 F. (1933-34) at the Main Farm Parbhani.*

Serial No.	Strain No.	Per cent Final Stand	Average Grain Yield per Plant	1,000 Seeds Weight	Average Interval between Planting & Awn Emergence
			Grams	Grams	Days
1	2	3	4	5	6
1	P. B. N. 507 -14	70	10.55	42.25	64.0
2	P. B. N. 507 -15	71	13.00	46.00	66.5
3	P. B. N. 507 -23	59	12.65	47.50	65.5
4	P. B. N. 519 - 2	75	10.04	47.50	65.0
5	P. B. N. 519 - 4	82	10.07	49.00	69.0
6	P. B. N. 519 - 8	78	10.01	45.50	63.0
7	P. B. N. 520 - 7	76	8.04	48.75	67.0
8	Med. 511 -53	63	10.25	49.00	63.0
9	Med. 508A- 4	64	12.25	48.25	64.0
10	Med. 509 -14	79	9.90	47.05	65.0
11	Med. 509A- 2	65	12.75	48.00	66.5
12	Med. 510 -59	71	11.75	48.05	64.0
13	Med. 511 -56	63	12.20	46.00	65.0
14	Med. 511 -60	64	10.85	51.00	60.5
15	Med. 512 - 1	60	12.90	46.75	63.0
16	Med. 512 -96	73	11.50	49.75	63.5
17	Med. 512A- 5	69	11.85	50.75	63.5
18	Med. 512A- 6	71	12.15	46.05	65.0
19	Med. 512A-45	66	11.85	49.05	63.5
20	Med. 513 - 1	74	11.95	48.25	64.0
21	Med. 516 - 1	74	10.80	46.50	65.5
22	Med. 517 - 1	74	12.10	46.25	64.0
23	Med. 517 - 3	74	10.80	51.25	65.5
24	Med. 517 - 4	71	13.15	46.00	65.5
25	Med. 517 -14	61	18.60	47.00	64.5
26	Niz. 506 - 2	65	10.90	51.75	63.5
27	Niz. 506 - 8	64	12.15	49.00	64.0
28	Niz. 506 -10	59	14.20	51.75	64.0
29	Rai 505 - 2	81	8.95	42.05	57.5
30	Niz. 506 - 7	68	11.00	50.00	63.0
31	Med. 516 - 3	78	11.25	51.25	65.5
32	Med. 508A- 6	56	13.01	49.00	65.0

TABLE II.

*Showing the number of ears and grain yield in grams of 24 single-plant selections of wheat made in 1942-43 F. (1933-34) from new acquisitions from Bid and the Banshi wheat plots on the Main Farm, Parbhani.*

Serial No.	Culture No.		Number of Ears per Plant	Chaff Colour	Yield grams
1	2		3	4	5
1	Bd.	521 - 1	9	Red-Brown ..	12.0
*2	Bd.	521A- 1	13	White ..	20.5
*3	Bd.	522A- 2	12	Red-Brown ..	21.5
*4	Bd.	522A- 3	11	Brown ..	22.0
5	Bd.	525 - 6	9	Brown ..	13.0
6	Bd.	525 - 7	7	Light Brown ..	9.5
*7	Bd.	525A- 1	10	Light Brown ..	20.0
8	Bd.	527 - 7	7	Red-Brown ..	10.5
9	Bd.	527 - 8	6	Light Brown ..	8.5
10	P. B. N.	528 - 7	5	Light Red ..	8.5
11	P. B. N.	528 - 9	5	Light Brown ..	9.5
12	P. B. N.	528 -14	5	Ligth Brown ..	8.0
13	P. B. N.	528 -28	5	Light Brown ..	8.5
14	P. B. N.	528 -31	5	Light Brown ..	8.0
15	P. B. N.	528 -38	5	Light Brown ..	10.0
16	P. B. N.	528 -40	5	Light Brown ..	10.0
17	P. B. N.	528 -42	5	Light Brown ..	11.0
*18	P. B. N.	528 -55	15	Light Brown ..	18.5
*19	P. B. N.	528 -56	12	Light Brown ..	18.5
*20	P. B. N.	528 -58	16	Light Brown ..	21.5
*21	P. B. N.	528 -70	16	Light Brown ..	29.0
*22	P. B. N.	528 -74	17	Light Brown ..	28.0
*23	P. B. N.	528 -77	18	Light Brown ..	26.5
*24	P. B. N.	528 -79	18	Light Brown ..	27.0

\* These happened to be in a very fertile part of the plot, and hence, their yields are very high.

F. (1933-34) both inclusive and their combined average final stand, grain

FIVE RANK			ORDER OF MERIT		Remarks
N <sup>o</sup> 12 F.	1342-43 F.	Final Relative Rank over the Period of 4 Seasons	Rank	Strain	
2-33	1933-34				
5	16	17	18	19	20
	8	4	1	Osm. 72- 4	
	10	8	2	Osm. 119- 4	
	11	10	3	Osm. 23-10	
	4	6	4	PBN 130- 4	
	8	8	5	Osm. 58- 4	
	1	2	..	Osm. 69- 4	
	9	6	6	Osm. 64- 1	
	7	9	..	Osm. 85- 1	
	5	7	7	C. P. 137- 7	
	6	5	8	Osm. 41- 5	
	8	8	..	Osm. 104- 4	
	3	5	..	Osm. 23- 7	
	2	3	9	Osm. 115- 3	
	13	1	..	Ar. 17- 1	
	12	9	10	Ar. 12- 3	





*Programme of Work of the Economic Botanist, for the  
Year 1343-44 Fasli.*

1. *Rice*.—The samples of both the early and late varieties and new acquisitions will be tested against the standard types, and the most promising strains will be compared in replications with standards, for yield and fineness of the grain.

2. *Castor*.—Single plant selections and the progeny of crosses will be studied for characters of economic importance and for further selection. Oil content of the small seeded local variety will be investigated as compared with the large seeded varieties.

3. *Jowar*.—Detailed study of the samples of both Kharif and Rabi varieties will be continued. The most promising varieties will be compared among themselves in replications, for yield.

4. *Wheat*.—Detailed study of the selections and of the progeny of the cross will be continued. The most promising dry selections will be compared in replications. Studies of the various types for rust-resistance will be continued.

*Annual Report of the Agricultural Chemist, H.E.H. the Nizam's Government, for the year 1342-1343 F.*

During the period under report, I was on leave for one month and the Assistant Chemist Mr. Desai was on leave for three months; during Mr. Desai's Sick Leave Mr. Kalka Prasad, B.Sc., was temporarily employed for a month as the sugar juice analyses had to be carried on without interruption. During this period I was on tour for 102 days. Together with this if the holidays are also considered, it is evident that a lot of the analytical work of the section was done by Mr. Desai alone; and I should like to put on record my appreciation of the industrious nature and of the good work of Mr. Desai. I take this opportunity to express our indebtedness to the Director of Industries and the Chief Chemist, Industrial Laboratory, for the facilities offered to us for carrying out the work of this Section.

The Imperial Council of Agricultural Research appointed me on their Soil Science Committee on the recommendation of the Director of Agriculture. I attended a meeting of this Committee during the second week of February 1934 to discuss and report on the Soil Schemes submitted to the Imperial Council of Agricultural Research for grants.

In addition to the routine analysis of samples of manures, soils, etc., from the different sections of the Agricultural Department we had undertaken the following work:

1. Juice analysis of the different varieties of cane cultivated on the Himayatsagar Main Farm.
2. "Gul" analysis for the saltishness of "Gul" from Coimbatore sugar-cane varieties.
3. Complete analysis of the different black cotton soils was completed.

I had also to supervise the construction of the Laboratory of this Section which is being constructed at the Himayatsagar Main Farm, and I had to arrange for

the supply of the necessary apparatus, etc., for the Laboratory. From about the middle of October 1934 the Laboratory is expected to be ready for conducting the work of the Section.

*Chemical and mechanical analysis of some black cotton soils of the State.*—Analyses were done in connection with the soil surveys of the area under the proposed Tungabhadra and Purna Projects. As I am preparing a technical paper incorporating this work for publication, I am merely recording the work done in this report. Statements I and II giving the results of these analyses are attached to this report.

*Juice analyses of the different cane varieties.*—This work was done from about 10-12-1933 to 19-2-1934 for the different varieties of canes which were sent from the Himayatsagar Main Farm. For C.O. 213 canes were also sent from the Mahbubnagar Farm for juice analysis from the first week of March to the end of May. The results of the analyses are given in Statement III and an abstract Statement (Statement IV) of these analyses together with the field data obtained from the Himayatsagar Main Farm is also herewith attached, for a proper understanding of the behaviour of the different varieties. The juice percentage obtained with the Hand Crusher in the Laboratory cannot be considered as accurate as this crusher was always getting out of order (being very old) and frequent adjustments had to be made which altered the crushing efficiency. (Crushing percentage varied from 40 to 60). So the data obtained from the Himayatsagar Main Farm can be taken as accurate and these are included in Statement IV. Dry matter in juice was not determined as it was not possible to dry the juice at constant temperatures with the facilities at hand.

### C.O. 213.

The sucrose per cent. varied between 14 and 22 per cent. during the period when the juice was analysed. When the cane was harvested, during the second week of February, the sucrose content was at its maximum with 21.83 per cent. The content of reducing sugars varied between 0.10 and 1.13 per cent., with an average of 0.30 per cent.; only once it was noted to be 1.13 per cent.

Cane of this variety was obtained from the Mahbubnagar Farm from first week of March to the end of May 1934 to note the variation in juice and sucrose contents. During this period marked decrease either in the juice or in the sucrose content was not noted. From 4-3-34 to 8-4-34 the sucrose per cent. was a little more than in the period following to 27-5-34. The average for the first five weeks (4-3-34 to 8-4-34) was about 16 per cent. while for the latter period the average was about 14.5 per cent. Similar difference is also noticeable in the Specific Gravity of the juice. Even allowing for the inefficiency of the crusher it will be noted that there was not much decrease in the juice percentage. There was also no increase in the content of the reducing sugars even during the last week of May.

From the data at hand it can be deduced that the sucrose percentage of this cane from Mahbubnagar is lower than for cane of this variety from Himayatsagar Main Farm. During the last week of February the sucrose content of this cane from Himayatsagar Main Farm was over 21 per cent., while during the middle of March the sucrose content of this cane from Mahbubnagar was only 16 per cent. There could not have been such a sudden decrease in the sucrose content within this short period, and it could be supposed that during the last week of February the sucrose content of C.O. 213 from Mahbubnagar could not have been much more than 17 or 18 per cent., as it would not be possible for a fall of 5 per cent. in sucrose content within this short period. This could be definitely ascertained by continuing this work with C.O. 213 from the Mahbubnagar Farm from December to May during the next season.

#### C.O. 223.

From 10-12-33 to 19-2-34 the average length of the cane was 8 feet 8 inches and weight per cane was 2.4 lbs., for C.O. 223 as compared to 7 ft. 4 in. and 2.2 lbs., respectively for C.O. 213. The average sucrose content for C.O. 223 was somewhat lower than that for C.O. 213 (less by about 2 per cent.), although the Specific Gravity of the cane juice was about the same during this period. Alkalinity in ash and the content of reducing sugars were about the same for both these varieties. The cane was harvested when the sucrose content was at its maximum which was 19.10 per cent.

Comparing the yield of cane, "Gul" etc., it is seen that although in yield and extraction percentage C.O. 223 was slightly better than C.O. 213 (by 1.8 per cent. and 3.2 per cent. respectively), C.O. 213 fared better in the percentage of "Gul" to cane and "Gul" to juice; actually 1,115 lbs. of more "Gul" were produced from 104,265 lbs. of cane of C.O. 213, as compared to the yield of 106,140 lbs. of cane of C.O. 223. The quality of "Gul" also (Statement V) of cane C.O. 213 was slightly better than "Gul" from C.O. 223. The "Gul" from C.O. 223 was found to be slightly more saltish.

#### C.O. 281.

In length, thickness and weight per cane C.O. 281 is similar to C.O. 213 and had maintained a good average of sucrose content, better than C.O. 213 and 223; the sucrose content varied between 16.78 and 19.16 per cent. with an average of 18.01 percentage for the period under observation. The cane was harvested at the time when its sucrose content was at its maximum i.e., 19.12 the alkalinity in ash is somewhat higher than in the other two varieties C.O. 213 and 223.

From the field data it will be seen that although this variety was the poorest in the yield than all the varieties, it exceeded the other C.O. varieties in extraction per cent. and percentages of "Gul" to juice and cane. Although this variety yielded only 83,250 lbs. as compared to 104,265 and 106,140 lbs. for C.O. 213 and 223, (or difference of over 21,000 lbs.). In "Gul" it was short only by 1,740 lbs. and 545 lbs. than C.O. 213 and 223 respectively. All factors considered together this variety can be said to have performed equal to any of the C.O. varieties.

#### C.O. 290.

This is a thicker cane than the other C.O. varieties and is as thick as Po. 2,878. (Diameter 1.26" C.F. to 0.95" for the other canes). The average sucrose per cent. is slightly more than that of C.O. 281 and alkalinity in ash was about the same as in C.O. 281, but the maximum sucrose content was 21.07 per cent. at the time of harvest. It is seen from the field data that this cane excelled all the other C.O. varieties of cane in "Gul" and the percentage of "Gul" to cane is fairly high although not

as high as in the case of C.O. 281. The "Gul" from C.O. 290 was not quite as saltish as the "Gul" from other C.O. varieties.

#### Poj 2878.

Although this cane is as thick as the cane of C.O. 290, the weight per cane is much higher (3.17 lbs. compared with 2.73 lbs. of C.O. 290). In sucrose content the average was about the highest of the varieties tried and the maximum content of sucrose was 24.47 per cent. at the time of harvest which is also the highest for all the varieties under trial. The yield of this cane is second only to H.M. 320 and higher than for any of the C.O. varieties. The yield of "Gul" is the highest for all varieties tested. (Including H.M. 320).

The percentage of "Gul" to the cane for this variety was 13.16 which is about the highest for all the canes (excluding Figi B—the growth of which was noted to be not quite normal as the growth was stunted with very short internodes); considering all these factors this variety can be said to have performed the best of all the canes tried.

#### Poj 2714.

This is a thicker and heavier cane than Poj 2878 and also somewhat taller. The average sucrose content was almost equal to that of Poj 2878—but the maximum sucrose content was only 21.88 per cent. at the time of in the ash and the content of reducing sugars was about harvest as compared to 24.47 for Poj 2878. Alkalinity the same for the Poj varieties.

The yield per acre for this cane is somewhat low (by about 7,870 lbs.) as compared to Poj 2878, but was higher than for any of the C.O. varieties; same is true for "Gul" per acre also. The percentage of "Gul" to cane is also slightly less than that for Poj 2878 (less by 0.26 per cent.).

#### *H.M. 544 Striped and Unstriped.*

Both these varieties had performed equally well in all the factors considered excepting in the percentage of "Gul" to cane, in which the striped cane was somewhat better than the unstriped (by about 0.88 per cent.). This

difference in the yield of "Gul" of these two varieties is only 640 lbs. in favour of the striped cane and in the *yield* of cane the unstriped yielded 3,480 lbs. cane more than the striped. The differences between these two can be said to be negligible. Compared to other canes, in average sucrose content they were poorer than all the canes tested and in yield of cane were better than all the C.O. varieties and also Poj 2714—but in yield of "Gul" they fared as well as C.O. 213 and better than C.O. 223 and 281, but poorer than C.O. 290 and Poj 2878 and 2714. The average content of reducing sugars was somewhat higher than for all the varieties discussed above; and the alkalinity in the ash was slightly less than in the other varieties. The saltishness in "Gul" from this cane was not as apparent as in the C.O. varieties.

#### H.M. 320.

This is a slightly thicker and heavier cane than Poj 2878 but not as thick and heavy as Poj 2714. In average sucrose content it fared as well as the Poj varieties with an average percentage of 18.75 and had the maximum content of sucrose of 22.33 per cent. at the time of the harvest (17-2-1934). Alkalinity in ash and content of reducing sugars were about same as in C.O. varieties.

In yield of cane this variety excelled all (14,540 lbs. more than that of Poj 2878)—but because of the poorer percentage of "Gul" to cane the "Gul" per acre was less than that for Poj 2878 (less by about 795 lbs.). In percentage of "Gul" to cane Poj 2878 was higher than for this variety by about 2 per cent. (13.16 per cent. for Poj 2878 as compared to 11.20 per cent. for H.M. 320). Of the three H.M. varieties tested this is undoubtedly the best and when compared to all others tested second only to Poj 2878.

#### D. 109.

This is a slightly heavier cane than Poj 2878 (weight per cane 3.40 lbs. as compared to 3.17 lbs. per cane of Poj 2878) with the average sucrose content as high as in C.O. 213 and 223 and the content of reducing sugars were about same as for the C.O. varieties. This was in the Multiplication plots and field data would be available next season. This seems to be a promising cane.

*Figi. B.*

This cane seemed to be stunted, being rather short (only 4'-5" high) and the internodes were very close to each other; this was the thickest of all the canes under trial with an average diameter of about 1.50". The average sucrose per cent. was equal to that of C.O. varieties and in alkalinity in ash and content of reducing sugars was about the same as other canes.

Like C.O. 281 this had a low yield compared to other canes but the percentage of "Gul" to cane was the highest with 13.69 and C.O. 281 was second in this respect with 13.37. Although this is the second lowest in the yield of cane, was the Vth highest in yield of "Gul."

*E.K. 28.*

This is a slightly heavier cane than Poj 2878. The analyses were not continued till the end of February as in the case of other canes when the maximum sucrose content was found in the cane. So, work on this will have to be continued next year, when this cane will be planted for field trials. This can be said to be a promising cane as in the middle of January the sucrose per cent. was 18.89 with a Specific Gravity of 1.088.

From the above discussion it can be said that Poj 2878 is easily the best of the canes tried with H.M. 320, a close second, then can be ranked Poj 2714 and C.O. 290. It would be well worth trying selections from C.O. 281 and Figi B, for high yielding canes, as they had the highest percentage of "Gul" to cane.

*Analyses of "Gul" samples.*—Statement 5 (attached).

This work was taken up to investigate the cause of saltishness in "Gul" made from Coimbatore varieties. "Gul" from the different Government Farms and a few from the "Gul" manufacturing centres, made from Coimbatore and other cane varieties was received for comparison. In statement 5 (attached) is given the results of the analyses of all the "Gul" samples. From a perusal of this statement, it will be seen that the "Gul" made from C.O. 213, 223 and 281 from the Himayatsagar Main Farm was found to be saltish. "Gul" from the other varieties from Himayatsagar Main Farm was not

saltish (a few tasted very slightly saltish but being not sure of this were declared sweet): The "Gul" samples found saltish needed over 9. CC. of Normal Acid to neutralize the alkalinity in ash from 100 grams "Gul." One sample from Yadgir which required 17.55 CC. Normal Acid for neutralizing the acidity in ash from 100 grams "Gul" was not saltish. In the preparation of this "Gul" ash was used for clarifying and possibly the alkalinity is due to potash salts in the ash which do not lend saltish taste to the "Gul." The "Gul" made from these varieties (C.O. 213, 223 and 281) from other farms did not have the saltish taste. Only in case of "Gul" from C.O. 213 from the Rudrur Farm, was saltishness found. It is intended to examine the soils from the plots in Himayatsagar and Rudrur Farms, cane from which yields saltish "Gul," for it is known that if the soils contain large amounts of soluble salts, the juice of cane grown in such soils is richer in salt content.

The "Gul" samples from Rudrur and Parbhani farms had a higher content of reducing sugars than those from Himayatsagar Main Farm. Although the clarifying agents used were same on all the farms, the "Gul" samples varied a lot in colour, keeping quality and hardness. On the whole the samples from Himayatsagar Main Farm were hard, yellowish and reddish brown and were keeping quite well for over two months after the receipt of the samples. The Rudrur samples were good in colour, with golden yellow and reddish brown, but were not so hard as those from Himayatsagar Main Farm; they did not keep so well, as after four weeks most of the samples had become sticky. The samples from Parbhani Farm were not so good, as most of the "Gul" samples had a burnt flavour and were dark brown in colour. They were quite soft by the time they were received in the laboratory and in some samples fermentation had already set in.

*Inspections.*—During this period under report, I had inspected and reported on lands under Kochanknur tank in Shorapur Taluk, Gulbarga District, and on the irrigated lands under Sirala tank in Nanded District. I had also inspected the irrigated lands under Deccan canals in Bombay presidency along with Mr. M. Gopalan, Special Superintending Engineer, Capital Works and Mr. Jehangir B. Metha, Acting Settlement Commissioner

and we are submitting our Joint Report to the Government. The object of our visit to the Deccan canals was to acquaint ourselves with the problems of intensive irrigation and to study (1) the methods of soil and sub-soil surveys to classify lands for intensive irrigation and (2) the methods for controlling irrigation to minimise dangers of "Water logging" (3) methods of reclaiming water-logged areas.

*Equipping laboratories at Rudrur and Raichur.*— I had equipped a small laboratory at the Rudrur Farm, in the Nizamsagar area, with the necessary apparatus for conducting cane juice analyses in connection with the varietal tests; it is hoped that an assistant will be permanently posted at Rudrur to work on the soils' problems of the Nizamsagar area. Since work on Dry Farming is in progress at the Raichur Farm, I had equipped the laboratory there with the necessary apparatus for conducting soil analysis in connection with the "Dry Farming" work. Mr. Savanoor, Senior Assistant in the "Dry Farming" scheme will be in charge of the analytical work at Raichur; a good lot of the analytical work in this connection will have to be done in the main laboratory at the Himayatsagar Main Farm, for lack of necessary facilities at Raichur.

P. G. KRISHNA,  
*Agricultural Chemist*

## STATEMENT I.

## Chemical analysis of soils.

No.	Survey No.	Village	Taluk	District	Soil strata	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	N	Remarks
2.2	23	Dhanura	Nander	Nanded	0.8"	42.08	10.60	9.20	7.33	0.724	1.611	.092	.085	Purna area
2.13	57	Thoraway	Basmat	do	0.8"	48.74	11.72	10.80	3.37	0.912	1.529	.057	.035	do
5	146	Banswada	Banswada	Nizamabad	24", 30"	64.94	11.94	3.00	1.595	1.50	2.442	.075	.047	Nizamsagar area.
6	do	do	do	do	0.8"	69.83	11.78	4.40	1.395	1.029	1.316	.044	.039	do
18	86	Hirur	Gangavati	Raichur	0.8"	58.88	9.33	4.44	7.16	2.66	1.235	.129	.033	Tungbhadra & Upper Krishna area
38	812	Edapnur	Gadwal	do	0.8"	60.40	9.49	9.51	3.61	0.826	0.555	.024	.014	do
59	52	Mamdapur	Raichur	do	0.8"	61.60	7.77	7.61	2.70	1.470	0.407	.027	.016	do
62	107	Marchetal	do	do	0.8"	57.41	16.70	6.56	5.96	1.163	0.369	.063	.025	do
64	164	Hosalli	Gangavati	do	0.8"	51.42	10.80	5.60	8.93	1.758	0.407	.072	.073	do
84	327	Pullur	Alampur	do	0.8"	50.08	9.52	6.80	4.985	1.929	0.501	.065	.051	do
89	6	Nagaddini	Devdurg	do	0.8"	52.57	10.36	11.04	5.005	1.607	1.110	.067	.023	do
93	505	Elkur	Gadwal	do	0.8"	65.20	8.02	5.28	4.260	0.977	..	.095	.052	do
99	524	Sindnur	Sindnur	do	0.8"	45.34	12.50	8.34	6.560	3.044	0.756	.090	.064	do
134	195	Potahal	do	do	0.8"	67.05	11.86	6.96	1.995	1.52	..	.780	.0327	do
50	316	Bichal	Raichur	do	0.8"	60.06	14.25	5.14	2.14	0.720	1.180	.078	.055	Tungabhadra area under paddy.
74	150	Maddikatta	Nandial	Karnool	0.8"	54.38	13.32	7.10	4.40	6.739	0.741	.107	.076	Karnool Kadapa area under paddy.

# STATEMENT II.

*Mechanical analysis of Tungbhadra and other samples.*

	NIZAMSAGAR AREA				GADWAL		RAICHUR (PADDY)	
	Banswada 146 0-8" 6	Banswada 146 28"-30" 3	Rampur 112/8 0.9" 11	Rampur 112/3 24"-30" 9	Edapnur 832 0.8" 88	Edapnur 832 24"-32" 39	Bichal 316 0-8" 50	Bichal 316 20"-30" 51
Taluk Village Survey No. Stratum Sample No.								
Moisture ..	5.35	6.99	5.76	5.26	7.28	7.02	6.69	7.61
Loss on ignition ..	4.71	4.98	4.66	5.96	5.96	6.69	4.52	5.13
Loss on solution ..	0.51	0.50	0.54	0.44	0.44	0.43	0.33	0.46
Coarse sand ..	9.73	11.76	8.16	11.33	7.18	5.12	0.67	2.64
Fine sand ..	22.83	19.50	20.50	21.70	21.48	20.10	29.55	19.02
Silt ..	12.10	8.90	13.00	8.95	17.80	13.05	22.25	12.90
Fine silt ..	18.85	16.20	15.90	14.90	20.35	24.60	21.45	23.50
Clay ..	25.80	31.45	31.60	31.50	19.55	23.25	14.85	20.10

STATEMENT II. (continued.)

*Mechanical analysis of Tungubhadra and other samples.*

	RAICHUR		GANGAWATI		KARNOOL-KADDAPPAH (PADDY)			
	Mamdapur 52 0.8" 59	Mamdapur, 52 24"-32" 60	Honsial- Hoda 102 0.8" 76	Honsial- Hoda 102 20"-28" 70	Meddikatla 161/2 0.8" 83	Meddikatla 161/2 18"-26" 76	Nandial 10 0.8" 78	Nandial 10 20"-28" 80
Taluk Village Survey No. Stratum Sample No.								
Moisture ..	6.28	8.56	9.85	6.18	10.13	7.75	6.49	7.33
Loss on ignition ..	6.25	7.55	6.64	7.97	7.98	8.03	5.37	5.06
Loss on solution ..	0.58	0.47	0.55	0.56	0.11	0.03	0.24	0.24
Coarse sand ..	6.02	8.89	8.20	8.01	2.75	5.32	5.06	4.54
Fine sand ..	15.68	11.55	17.22	15.39	34.80	35.73	30.12	19.60
Silt ..	15.50	12.15	17.50	20.45	12.45	13.60	16.15	16.70
Fine silt ..	17.50	19.10	23.00	21.05	20.70	18.40	21.80	26.90
Clay ..	32.20	31.95	22.30	25.65	12.15	11.25	14.60	19.50

# STATEMENT II. (concluded).

*Mechanical analysis of Tungabhadra and other samples.*

Taluk Village Survey No. Stratum Sample No.	ALAMPUR		DEODURG		GADWAL			
	Pullur 327 0.8" 84	Pullur 327 12"-24" 85	Nagaddini 6 0.8" 89	Nagaddini 6 20"-28" 90	Elkure 505 0.6" 93	Elkure 505 30"-36" 92	Poodoor 833 0.8" 105	Poodoor 833 20"-30" 104
Moisture ..	6.62	7.40	8.97	9.47	7.34	7.70	3.62	3.52
Loss on ignition ..	7.25	7.73	7.01	5.89	5.47	2.21	2.02	5.40
Loss on solution ..	0.08	0.07	0.30	0.38	0.47	0.45	0.25	0.52
Coarse sand ..	2.83	2.82	8.94	9.26	21.23	31.62	46.32	30.26
Fine sand ..	39.71	39.02	36.02	38.92	32.82	31.23	37.21	15.36
Silt ..	19.05	18.50	15.65	12.50	8.60	3.10	1.75	4.75
Fine silt ..	15.75	16.15	18.50	22.95	11.25	6.10	2.80	4.00
Clay ..	8.60	8.60	4.60	0.40	12.75	18.15	6.50	36.00

## STATEMENT III.

*Analysis of sugar-cane varieties from Himayatsagar and Mahboobnagar farms, H. E. H. the Nizam's Agricultural Department for 1943 Fashi.*

Serial No.	Date	Variety	Number of canes in one stool	Weight of canes	Average height	Average diameter	Per cent. juice in cane	Sp. Gr. of juice	Per cent. of reducing sugar (in 100 gms.)	Sucrose per cent. (in 100 gms., juice)	Alkalinity in ash per 100 gms. juice
1	2	3	4	5	6	7	8	9	10	11	12
1	12-12-33..	Co. 213 Himayatsagar Farm. do do do do do do	6	Lbs. 12	6'-11"	1"	60.4	1.088	0.73	16.97	N. acid. 1.4 cc.
2	20-12-33..		6	15	7'-8"	1.1"	45.3	1.083	1.13	13.89	..
3	26-12-33..		5	12.75	8'-5"	1.2"	50.0	1.089	0.62	16.00	..
4	2- 1-34..		4	11.0	8'-11"	1.1"	50.0	1.093	0.14	17.15	..
5	10- 1-34..		4	8.5	7'-8"	0.8"	49.7	1.089	0.21	13.40	..
6	22- 1-34..		5	9.5	7'- 4"	0.9"	63.1	1.083	0.11	18.62	..
7	6- 2-34..		4	8.5	8'- 5"	0.9"	44.1	1.089	0.21	20.48	1.2 cc.

8	15- 2-34..	do	5	8.2	6'-11"	0.8"	42.4	1.087	0.23	21.83	1.4 cc.N.acid.
9	4- 3-34..	Co. 213 Mahbubnagar..	12	27.0	7'-7"	1.0"	50.0	1.073	0.52	15.31	2.4 "
10	10- 3-34..	do	12	15.0	..	..	43.0	1.075	0.13	16.07	0.6 "
11	17- 3-34 ..	do	11	24.75	8'-2"	1.0"	50.0	1.078	0.07	17.24	1.8 "
22	21- 3-34	do	10	22.5	9'- 1"	0.9"	44.4	1.083	0.24	15.85	2.6 "
13	8- 4-34..	do	7	19.25	9'-10"	1.0"	46.75	1.078	0.32	16.29	1.2 "
14	14- 4-34..	do	6	15.0	10'-2"	0.9"	51.6	1.070	0.22	14.33	0.8 "
15	29- 4-34..	do	12	27.5	9'- 4"	1.0"	47.3	1.071	0.20	15.06	1.4 "
16	6- 5-34..	do	12	22.0	7'- 8"	0.8"	48.0	1.067	0.24	12.99	1.7 "
17	13- 5-34..	do	8	19.0	9'- 4"	1.0"	46.0	1.066	0.30	13.88	1.7 "
18	20- 5-34..	do	11	28.0	9'- 8"	1.0"	50.0	1.072	0.07	14.89	1.0 "
19	27- 5-34..	do	11	24.0	8'-11"	1.0"	50.0	1.069	0.18	15.85	1.0 "
20	10-12-33..	Co. 223 Himayatsagar Farm.	..	..	..	..	..	..	1.11	15.28	..
21	18-12-33..	do	5	13.5	8'- 2"	1.1"	50.0	1.079	0.82	15.05	..
22	30-12-33..	do	4	8.5	9'-3"	0.8"	50.0	1.082	0.38	13.22	..

## STATEMENT III.—(contd.)

*Analysis of sugar-cane varieties from Himayatsagar and Mahabodnagar farms, H.E.H. the Nizam's Agricultural Department for 1943 Fasl.*

Serial No.	Date	Variety	Number of canes in one stool	Weight of canes	Average height	Average diameter	Per cent. juice in cane	Sp. Gr. of juice	Per cent. of reducing sugar (in 100 gms.)	Sucrose per cent. (in 100 juice)	Alkalinity in ash per 100 gms. juice
1	2	3	4	5	6	7	8	9	10	11	12
23	27-1-34..	Co. 228 Himayatsagar Farm.	6	10.0	7'-1"	0.8"	40.0	1.090	0.22	17.68	N acid. 1.3 cc.
24	9-2-34..	do	5	14.0	9'-3"	1.0"	41.0	1.088	0.18	18.90	1.6 "
25	19-2-34..	do	5	13.5	9'-8"	1.0"	48.1	1.087	0.30	19.10	0.9 "
26	16-12-33..	Co. 281	4	9.5	8'-0"	1.2"	57.84	1.084	0.25	18.02	..
27	23-12-33..	do	5	10.75	7'-0"	1.0"	50.0	1.081	0.17	17.58	..
28	8-1-34..	do	4	13.5	9'-1"	0.7"	50.0	1.094	0.10	17.43	..
29	29-1-34..	do	5	9.5	7'-0"	0.9"	42.1	1.090	0.10	16.78	2.0 "
30	7-2-34..	do	6	11.5	7'-7"	0.9"	48.0	1.096	0.06	19.16	2.1 "

31	17- 2-34..	do	5	11.0	6'- 4"	1.0"	47.7	1.096	0.10	19.12	1.8 "
32	12-12-33..	Co. 290.	4	12.25	6'-11"	1.2"	61.2	1.089	0.48	15.32	1.9 "
33	20-12-33..	do	4	8. 5	6'- 8"	1.4"	54.7	1.074	1.90	9.92	..
34	26-12-28..	do	5	13.25	8'- 3"	1.6"	50.24	1.088	0.23	16.15	..
35	2- 1-34..	do	5	13.6	7'- 5"	1.1"	53.3	1.095	0.19	18.18	..
36	10- 1-34..	do	4	12. 0	7'- 8"	1.2"	44. 8	1.090	0.20	18.81	..
37	22- 1-34..	do	4	11. 3	7'- 0"	1.0"	53. 0	1.096	0.14	20.42	..
38	6- 2-34..	do	5	17.25	7'- 7"	1.2"	..	1.100	0.17	20.67	1.9 "
39	15- 2-34..	do	4	11.25	7'- 3"	1.2"	46.6	1.095	0.24	21.07	1.8 "
40	12-12-33..	POJ. 2878	4	14.0	7'-11"	1.3"	60.7	1.096	0.52	19.36	0.7 "
41	20-12-33..	do	4	10.75	6'- 9"	1.2"	50.0	1.088	0.96	17.88	..
42	26-12-33..	do	5	12.0	6'- 4"	1.0"	52.1	1.088	0.59	16.33	..
43	2- 1-34..	do	4	13.0	6'-10"	1.3"	51.92	1.098	0.25	19.34	..
44	10- 1-34..	do	4	18.75	7'	1.4"	43.8	1.088	0.12	18.07	..
45	22- 1-34..	do	6	21.0	8'	1.1"	..	1.090	0.12	18.61	..

## STATEMENT III—(contd.)

*Analysis of sugar-cane varieties from Himayatsagar and Mahboobnagar farms, H.E.H. the Nizam's Agricultural Department for 1943 Fashi.*

Serial No.	Date	Variety	Number of canes in one stool	Weight of canes	Average height	Average diameter	Per cent. juice in cane	Sp. Gr. of juice	Per cent. of reducing sugar (in 100 gms.)	Sucrose per cent. (in 100 gms. juice)	Alkalinity in ash per 100 gms. juice
1	2	3	4	5	6	7	8	9	10	11	12
46	6- 2-34..	POJ. 2878.	5	13.0	6'- 8"	1.6"	46.1	1.088	0.77	18.93	N. acid. 1.1 cc.
47	15- 2-34..	do	5	15.0	7'- 3"	1.3"	41.6	1.100	0.24	24.47	1.2 " "
48	16-12-33..	POJ. 2714.	4	15.0	6'-10"	1.5"	52.46	1.091	0.48	17.97	..
49	23-12-33..	do	6	20.0	7'- 2"	1.4"	56.70	1.085	0.24	19.59	..
50	8- 1-34..	do	6	17.75	8'- 6"	1.2"	49.24	1.095	0.25	18.13	..
51	29- 1-34..	do	4	25.0	8'- 6"	1.5"	47.0	1.100	0.12	18.73	1.4 " "
52	7- 2-34..	do	4	20.0	8'- 3"	1.7"	55.0	1.099	0.08	18.5	0.9 " "
53	17- 2-34..	do	4	16.25	8'- 3"	1.3"	47.7	1.101	0.10	21.88	1.4 " "

54	12-12-33..	H. M. 544 (Unstriped).	5	15.0	5'	1.4"	61.6	1.071	1.83	13.32	0.8 "
55	20-12-33..	do	4	16.75	6'-2"	1.4"	52.2	1.078	..	..	..
56	26-12-33..	do	4	14.0	6'-3"	1"	82.0	1.088	0.891	16.33	..
57	2-1-34..	do	4	11.75	5'-8"	1.1"	51.0	1.080	1.07	13.78	..
58	10-1-34..	do	4	14.0	6'-11"	1.3"	45.53	1.083	0.84	18.05	..
59	22-1-34..	do	4	10.0	5'-11"	1.2"	50.0	1.075	0.83	17.08	..
60	6-2-34..	do	5	19.0	6'-5"	1.3"	..	1.102	0.14	22.66	1.4 "
61	15-2-34..	do	4	26.0	8'-5"	1.5"	59.0	1.085	0.60	19.16	1.0 "
62	10-12-33..	H. M. 544 (Striped)	..	..	..	..	..	..	1.66	16.57	..
63	18-12-33..	do	4	16.25	5'-6"	1.5"	47.6	1.078	1.16	14.74	..
64	30-12-33..	do	5	20.0	8'-5"	1.3"	58.75	1.083	0.69	14.90	..
65	27-1-34..	do	5	13.5	5'-4"	1.2"	44.4	1.076	1.03	16.12	0.7 "
66	9-2-34..	do	4	13.0	6'	1.3"	44.2	1.082	0.44	18.45	0.8 "
67	19-2-34..	do	5	15.0	5'-3"	1.3"	50.0	1.086	0.55	20.22	0.8 "
68	16-12-33..	H. M. 320	5	21.75	7'-1"	1.4"	53.11	1.088	0.31	17.34	..
69	23-12-33..	do	4	17.5	7'	1.4"	46.4	1.078	0.63	17.76	..

## STATEMENT III—(concl'd).

*Analysis of sugar-cane varieties from Himayatsagar and Mahboobnagar farms, H.E.H. the Nizam's Agricultural Department for 1948 Fash.*

Serial No.	Date	Variety	Number of canes in one stool	Weight of canes	Average height	Average diameter	Per cent. juice in cane	Sp. Gr. of juice	Per cent. of reducing sugar (in 100 gms.)	Sucrose per cent. (in 100 gms. juice)	Alkalinity in ash per 100 gms. juice
1	2	3	4	5	6	7	8	9	10	11	12
70	8-1-34 ..	M. H. 320	4	15.25	6'-10"	1.1"	60.65	1.086	0.32	19.15	..
71	29-1-34 ..	do	4	13.25	6'-7"	1.3"	41.5	1.060	0.32	18.09	1.4cc N. Acid
72	7-2-34 ..	do	5	17.25	6'-7"	1.2"	56.5	1.091	0.31	17.85	1.2 "
73	17-2-34 ..	do	5	21.25	7'-1"	1.5"	45.8	1.095	0.18	22.33	0.8 "
74	16-12-33..	D. 109	4	15.5	8'-5"	1.3"	54.90	1.083	1.36	14.81	..
75	23-12-33..	do	4	16.0	5'-6"	1.3"	55.50	1.095	1.15	13.50	..
76	8-1-34 ..	do	4	16.0	8'-4"	1.2"	54.70	1.088	0.57	17.09	..
77	29-1-34 ..	do	4	15.25	8'-1"	1.2"	45.90	1.092	0.41	18.60	1.3 "

78	7-2-84 ..	do	5	13.5	6'-5"	1.0"	54.0	1.093	0.24	18.44	1.4, ,,
79	17-2-84 ..	do	5	12.25	7'	1.2"	47.0	1.092	0.26	20.38	1.2, ,,
80	10-12-88..	Fiji B.	..	..	..	..	..	..	1.69	13.95	..
81	18-12-88..	do	4	10.25	3'-10"	2.0"	48.78	1.094	0.25	19.70	..
82	30-12-88..	do	4	9.5	4'-2"	1.4"	60.5	1.083	0.27	15.2	..
83	27-1-84 ..	do	4	14.0	4'-9"	1.5"	48.2	1.087	0.22	19.49	0.4, ,,
84	9-2-84 ..	do	4	12.5	5'-1"	1.2"	54.0	1.083	0.40	18.17	1.0, ,,
85	19-2-84 ..	do	4	10.0	4'-3"	1.4"	52.5	1.087	0.40	19.99	1.4, ,,
86	10-12-88..	E. K. 23	..	..	..	..	..	..	0.81	17.62	..
87	18-12-88..	do	4	18.25	8'-2"	1.4"	55.1	1.091	0.62	12.51	..
88	30-12-88..	do	5	15.25	5'-11"	1.3"	55.8	1.090	0.21	16.14	..
89	27-1-84 ..	do	5	14.25	5'-8"	1.2"	52.6	1.088	0.38	18.39	0.7, ,,

STATEMENT IV.  
Abstract statement for cane-juice analyses of the different varieties, together with the field data from the farm.

C. O. VARIETIES					OTHER VARIETIES							
Items	213	223	231	290	Poj 2878	Poj 2714	H. M. 544	H. M. 544	H. M. 320	D 109	Figi B	E K 28
	2	3	4	5	6	7	8	9	10	11	12	13
Average height ..	7'-11"	8'-8"	7'-5"	7'-4"	7'-1"	7'-11"	(Unstrip- ed) 6'-4"	(Striped) 6'-1"	6'-10"	7'-3"	4'-5"	6'-7"
Average thickness ..	0.97"	0.95"	0.95"	1.26"	1.27"	1.43"	1.27"	1.28"	1.30"	1.20"	1.50"	1.30"
Average weight lbs. ..	2.2	2.4	2.26	2.70	3.17	4.1	3.7	3.38	3.92	3.40	2.81	3.41
Average sucrose % ..	17.30	17.34	18.01	18.25	19.12	19.13	15.05	16.83	18.75	17.14	17.75	16.17
Average reducing sugars % ..	0.42	0.50	0.14	0.47	0.48	0.21	0.74	0.92	0.34	0.66	0.54	0.50
Average Specific Gravity ..	1.088	1.085	1.090	1.092	1.095	1.083	1.083	1.081	1.083	1.090	1.087	1.090
Maximum sucrose % ..	21.83	19.10	19.16	21.07	24.47	21.88	22.66	20.22	22.33	20.38	19.99	18.39
Minimum sucrose % ..	13.40	15.05	16.78	*(9.92)	16.33	17.97	13.32	14.74	17.34	13.50	13.95	12.54
Maximum Specific Gravity ..	1.093	1.090	1.096	1.100	1.100	1.101	1.102	1.088	1.095	1.095	1.094	1.091
Minimum Specific Gravity ..	1.083	1.079	1.081	*(1.074)	1.088	1.085	1.071	1.076	1.060	1.083	1.083	1.083
Alkalinity in ash in 100 grams ..	1.03	1.26	1.96	1.86	1.00	1.23	1.06	0.76	1.20	1.30	0.93	0.70
Yield per acre cane in lbs. ..	1,04,265	1,06,140	83,250	1,11,325	1,20,820	1,12,950	1,17,950	1,14,470	1,35,360	..	97,490	..
Juice in lbs. ..	60,565	64,110	53,080	70,330	76,515	69,570	73,760	75,870	90,270	..	..	..
Extraction % ..	58.08	60.40	63.75	63.17	63.33	61.5	62.53	66.28	66.68	..	65.52	..
'Gul' in lbs. ..	12,780	11,675	11,130	13,715	15,955	14,560	12,200	12,840	15,160	..	13,350	..
'Gul' to juice % ..	21.10	18.21	20.96	19.50	20.85	20.92	16.54	16.92	16.67	..	20.89	..
'Gul' to cane % ..	12.25	10.99	13.37	12.30	13.16	12.90	10.34	11.22	11.20	..	13.69	..

\* Immature cane.

## STATEMENT V.

*Analysis of gur samples from different localities of the State and Government Farms 1343 Fash.*

No.	Variety	Date of manufacturing	Locality	Description	Moisture %	Sucrose %	Reducing sugars %	Ash %	Alkalinity in ash per 100 gms. sample	Remarks
1	2	3	4	5	6	7	8	9	10	11
1	Co. 213	12-1-34 ..	Himayat-sagar Farm.	Reddish brown, soft, saltish	5.18	86.67	5.26	3.16	13.50cc	Sajjeekhar bhendi juice as clarifier.
2	Do	21-1-34	do	do	6.06	84.84	2.86	3.39	11.9 "	do
3	Do	25-1-34	do	Reddish brown, hard	4.28	83.44	5.71	3.10	8.1cc "	do
4	Do	29-1-34	do	Yellowish B. hard	3.58	86.60	3.57	2.47	7.4 cc "	do
5	Do	..	Saidapur	Brown sweet hard	2.88	82.04	7.81	3.26	5.4 cc "	Improved method lime water as clarifier.
6	Do	..	Nander	Soft, dark B. ..	3.64	78.34	8.00	3.76	13.2 cc "	do
7	Do	..	Mahboob-nagar Farm.	Black with yellow tinge sticky.	5.95	70.93	8.65	4.81	8.6 cc "	Sajjeekhar bhendi juice as clarifier.
8	Do	..	Rudrur Farm	Golden yellow sweet and hard.	1.93	78.73	10.00	2.44	7.00 cc "	..
9	Do	..	do	Reddish B. hard, saltish ..	1.90	85.63	5.86	4.26	11.5 cc "	Castor cake 1,200 lbs. (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> 75 "
10	Do	..	do	Golden yellow, hard, saltish.	1.92	87.20	5.88	5.30	9.5 cc "	Castor cake 1,000, (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> 100 "
11	Do	..	do	Reddish B. sweet, hard ..	2.60	79.43	12.41	2.87	8.3 cc "	Castor cake 2,000 (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> 125 "
12	Do	..	do	Dirty B. sweet, and hard .	2.70	80.64	9.53	4.93	7.4 cc "	Castor cake 2,400 (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> 150 "

## STATEMENT V--(contd.)

Analyses of gur samples from different localities of the State and Government Farms 1943 Fasli.

No.	Variety	Date of manufacturing	Locality	Description	Moisture %	Sucrose %	Reducing sugars %	Ash %	Alkalinity in ash per 100 gms. sample	Remarks
1	2	3	4	5	6	7	8	9	10	11
13	Regar soil.	..	do	Pale reddish, B. sweet, hard.	2.50	80.55	9.62	1.92	5.1 cc "	Planted on 15-1-33.
14	" "	..	do	do	1.30	80.92	9.90	1.33	4.7 cc "	Planted on 15-2-33.
15	" "	..	do	Golden yellow, sweet, hard.	1.40	81.99	9.71	2.11	6.00 cc "	Planted on 15-3-33.
16	" "	..	do	do not so hard.	3.10	79.25	9.45	2.41	5.22 cc "	Planted on 15-4-33.
17	" "	..	do	Reddish B. sweet hard	2.70	80.40	13.04	2.04	Spoiled N. acid.	Planted on 15-11-32.
18	" "	..	do	Pale, yellow sweet, not so hard.	3.20	76.75	16.88	2.65	2.5 cc "	Planted on 15-12-32.
19	" Chalka soil.	..	do	Golden Y. sweet hard	1.70	73.80	10.84	2.67	4.4 cc "	Planted on 15-11-32.
20	" "	..	do	do	1.50	77.71	11.07	1.88	3.1 cc "	Planted on 15-12-32.
21	" "	..	do	do	1.60	80.86	11.97	2.25	4.7 cc "	Planted on 15-1-33.
22	" "	..	do	do	1.20	72.39	10.95	2.23	6.1 cc "	Planted on 15-2-33.
23	" "	..	do	do	1.20	74.55	11.44	1.53	3.00 cc "	Planted on 15-3-33.
24	" "	..	do	Reddish B. sweet, hard	1.60	73.03	8.96	2.55	6.2 cc "	Planted on 15-3-33.
25	" "	..	Parbhani Farm.	Dark B. burnt flavour, soft	4.90	79.28	12.56	4.35	3.2 cc "	Sajjeekhar, blendi juice.

26	Co. 223	10-1-34	Himayat-sagar, Farm	Reddish brown, soft, saltish.	6.85	82.86	4.44	3.17	13.0 cc "	Sajjeekhar bhendi juice.
27	do	21-1-34	do	Slightly saltish.	7.17	82.00	3.84	3.16	9.8 cc "	do
28	Do	24-1-34	do	do do ..	3.84	81.11	3.33	2.53	9.7 cc "	do
29	Do	29-1-34	do	Reddish brown soft sweet	4.09	87.59	4.34	1.64	8.7 cc "	do
30	Do	..	Rudrur Farm	Yellowish B. sweet hard ..	3.00	72.20	15.37	3.32	8.0 cc "	do
31	Do	..	Parbhani Farm.	Dark brown, burnt flavoured, soft	3.50	80.35	11.44	4.22	3.3 cc "	do
32	Co. 281	8-1-34	Himayat-sagar Farm.	Reddish brown soft, slightly saltish.	7.32	79.79	6.70	3.56	N. acid. 9.6 cc	Sajjeekhar bhendi juice.
33	Do	16-1-34	do	do	4.67	83.37	5.46	2.30	8.4 cc "	do
34	Do	23-1-34	do	Dark brown hard slightly saltish.	3.63	74.39	2.70	2.75	7.8 cc "	do
35	Do	30-1-34	do	Yellowish brown hard slightly saltish.	2.10	85.25	4.40	2.13	7.7 cc "	do
36	Do	..	Rudrur Farm	Dark brown hard, sweet ..	2.10	80.55	9.62	1.73	5.5 cc "	do
37	Do	..	Parbhani Farm.	Reddish brown soft, Burnt flavoured.	4.00	77.10	7.36	4.84	3.8 cc "	do
38	Co. 290	7-1-34	Himayat-sagar Farm.	Reddish brown soft, sweet	5.83	80.26	5.68	4.06	1.6 cc "	do
39	Do	13-1-34	do	do	6.67	83.88	6.53	3.16	8.1 cc "	do
40	Do	22-1-34	do	do	6.73	84.49	5.88	3.47	8.4 cc "	do
	Do	31-1-34	do	Yellowish brown, sweet, hard.	3.34	74.46	6.48	2.81	8.6 cc "	do
42	Do	..	Rudrur Farm	Dirty brown hard sweet ..	3.50	76.40	15.60	2.95	8.3 cc "	..
43	Do	..	Parbhani Farm.	Dark brown saltish ; sour soft.	4.20	73.01	10.30	5.55	6.1 cc "	Sajjeekhar bhendi juice.

**STATEMENT V—(contd.)**  
*Analyses of gur samples from different localities of the State and Government Farms 1343 Fash.*

No.	Variety	Date of manufac- turing	Locality	Description	Moisture %	Sucrose %	Reduc- ing su- gars %	Ash %	Alkalini- ty in ash per 100 gms. sample	Remarks
1	2	3	4	5	6	7	8	9	10	11
44	Poj. 2878	6-1-34	Himayat- sagar Farm.	Yellowish brown soft ; sweet.	4.75	86.24	5.71	2.35	7.4 cc N. Acid.	Sajjeekhar bhendi juice.
45	Do	26-1-34	do	do	6.50	86.27	2.40	1.64	5.4 cc "	do
46	Do	26-1-34	do	do	5.72	78.93	2.86	2.55	9.5 cc "	do
47	Do	30-1-34	do	Dark brown hard, sweet	3.35	81.25	7.70	2.53	6.9 cc "	do
48	Do	..	Rudrur Farm	Pale brown sweet ; hard	2.50	75.72	14.71	2.07	4.8 cc "	..
49	Do	..	Parbhani Farm.	Reddish brown soft ; B. fla- vour contains much foreign matter.	5.8	77.91	9.36	3.01	3.0 cc "	Sajjeekhar bhendi juice.
50	Poj. 2714	3-1-34	Himayat- sagar Farm.	Golden yellow sweet ; soft	6.70	86.43	3.25	2.20	5.8 cc "	do
51	Do	28-1-34	do	Yellowish B. sweet slightly soft.	4.77	85.52	4.16	1.86	8.9 cc "	do
52	Do	..	Rudrur Farm	Golden yellow sweet, hard	2.00	85.54	7.63	2.28	5.7 cc "	..
53	Poj. 2725	..	do	Reddish brown sweet, very hard.	1.30	86.46	8.37	1.60	4.5 cc "	..
54	H. M. 544 (striped)	4-1-34	Himayat- sagar Farm.	Reddish brown sweet ; soft	7.00	81.01	8.43	1.94	5.5 cc "	Sajjeekhar bhendi juice as clarifier.
55	Do	24-1-34	do	Yellowish brown little soft ; sweet.	4.38	88.01	3.38	1.38	6.4 cc "	do

56	Do	..	Rudrur Farm	Pale brown sweet ; hard	..	2.50	75.29	12.12	1.54	2.4 cc "	..
57	H. M. 544 (unstriped Do	80-12-33 31-1-34	Himayat- sagar Farm. do	Yellowish brown soft ; sweet. do do	..	6.20	80.22	12.05	1.80	5.0 cc "	Sajjeekhar bhendi juice.
58	Do	..	Rudrur Farm	Brown ; sweet ; hard	..	6.20	83.45	5.60	1.60	4.7 cc "	do
59	Do	..	Himayat- sagar Farm. do	Brown ; sweet ; soft Reddish brown sweet ; hard.	..	3.00	72.02	14.11	2.01	3.1 cc "	..
60	H. M. 320	81-12-88	Rudrur Farm	Pale brown sweet ; hard.	..	5.43	87.36	6.25	1.72	6.1 cc "	Sajjeekhar bhendi juice.
61	Do	24-1-84	Himayat- sagar Farm. do	Yellowish B. soft ; sweet do	..	3.95	84.04	4.76	1.52	6.9 cc "	do
62	H. M. 320	..	Rudrur Farm	Brown ; sweet ; hard	..	3.10	78.82	11.44	1.31	N. acid 2.9 cc	..
63	D. 109	1-1-84	Himayat- sagar Farm. do	Dark brown soft ; slightly burnt flavour.	..	4.35	82.66	7.81	2.40	3.8 cc "	Sajjeekhar bhendi juice.
64	Do	27-1-84	Rudrur Farm	Dark brown sweet ; hard do do	..	6.92	89.72	3.77	1.70	6.7 cc "	do
65	Do	..	Parbhani Farm.	Dark brown soft ; slightly burnt flavour.	..	3.90	75.19	8.00	1.52	4.4 cc "	..
66	Do	..	Himayat- sagar Farm. do	Dark brown sweet ; hard do do	..	5.20	76.48	17.16	3.02	5.2 cc "	Sajjeekhar bhendi juice.
67	Fiji B.	25-1-84	Rudrur Farm	Dirty brown sweet ; slightly soft.	..	2.54	84.48	4.29	1.47	6.7 cc "	do
68	Do	31-1-84	do	Golden yellow ; sweet ; hard	..	3.17	90.58	4.65	0.84	4.0 cc "	do
69	Do	..	do	Dark brown soft slightly sour	..	4.00	77.97	15.60	1.50	5.1 cc "	..
70	E. K. 28	..	do	Brown sweet soft	..	1.86	76.50	10.84	1.62	4.2 cc "	..
71	Do	..	Parbhani Farm.	Brown sweet soft	..	6.10	66.74	14.30	2.46	4.00 cc "	Sajjeekhar bhendi juice.
72	Local cane	..	UsafwadBid District.	Brown sweet hard	..	8.14	80.49	10.10	1.43	5.5 cc "	No clarifier used.
73	Do	..	Saidapur District.	Pale Reddish B. hard ; sweet	..	2.82	83.11	9.85	3.20	4.5 cc "	Local method.
74	Do	..	do			3.06	81.72	7.52	3.31	7.9 cc "	Improved method.

## STATEMENT V—(concl.)

Analyses of gur samples from different localities of the State and Government Farms 1843 Fash.

No.	Variety	Date of manufac- turing	Locality	Description	Moisture %	Sucrose %	Reduc- ing su- gars %	Ash %	Alkalini- ty in ash per 100 gms. sample	Remarks
1	2	3	4	5	6	7	8	9	10	11
75	Do	..	Nanded	Reddish brown hard ; sweet	2.63	79.33	12.65	2.23	7.1 cc "	..
76	Local white.	..	Yadgir, Dist. Gulbarga.	Reddish brown sticky ; sweet.	5.93	63.45	17.76	3.25	8.8 cc "	Line used for clarifi- cation Ash as clarifier.
77	Do	..	do	Dark brown sticky sweet ..	4.70	69.00	13.20	4.65	17.5 cc "	Improved method.
78	Pundya ..	..	Gangavati Dist. Raichur	Yellowish brown soft ; sweet.	5.10	72.68	20.88	1.97	4.3 cc "	Local method Scum not removed.
79	Do	..	..	Dirty dark brown sweet ; hard.	2.71	79.81	7.36	2.51	6.1 cc "	Sajjeekhar bhandi juice as clarifier.
80	Do	..	Parbhani Farm.	Reddish brown soft sweet ..	4.00	63.46	17.75	3.10	3.9 cc "	

*Programme of Work of the Agricultural Chemical  
Section, for the year 1343-44 Fasḥ.*

1. Analysis of juice of sugar-cane varieties for comparison.
2. Analysis of juice of C.O. 213 sugar-cane at different times of the year.
3. Analysis of gur of different varieties of sugar-cane.
4. Analysis of castor seed samples for oil-content.
5. Other routine analyses for the department.

*Annual Report of the Entomological Section, H.E.H. the Nizam's Government, for the Year 1342-43 Fasli.*

1. *Charge*.—Mr. Venkat Krishnan, Entomological Assistant, continued to hold charge of the Section throughout the year under report.

2. *Staff*.—Mr. Ranga Rao, Probationary Agricultural Officer, was deputed from 1st Amardad 1342 F., to work in the Section and was placed in charge of the Red Hairy Caterpillar and the Castor Semi-looper pests control work of the Jadcherla centre. Subsequently, during the month of Tir, 1343 F., his services were permanently transferred to the Section. Mr. Dhanpath Rai, the Senior Kamgar, looked after the campaign work of the Narkatpalli centre and the services of Mr. Ramamurthy, the Junior Kamgar, were mainly utilized for insect-rearing and office work at Headquarters.

3. *Tours*.—Mr. Venkat Krishnan was out on tour for 143 days, mainly for working the demonstration of control measures for the Red Hairy Caterpillar and the Castor Semi-looper pests. He also visited various farms and other places in the Dominions, from where reports had been received of insect pest damage, for first identifying the pest and then giving advice on popular methods of treatment.

4. *Pests and Enquiries*.—There were 120 enquiries during the year under report from various garden owners, *rai-yats*, revenue officials, farms and District Agricultural Officers. Most of these were answered through letters, and, in important cases, the Entomological Assistant himself visited the places and gave necessary help by way of control measures. The following are some of the important pests of which reports have been received:—

(i) *The Juar Kadbi Moth*.—Reports of severe damage to Juar hay-stalks were received from a number of villages in the Nalgonda and Mahbubnagar Districts.

(ii) *Paddy Hispa*.—Reports of damage, especially to the *tabi* crop of paddy, were received from

a number of villages in the Districts of Medak, Nizamabad and Gulberga.

(iii) *The Gram Caterpillar*.—A number of villages round about Sedhane, Shankerpalli and Gulberga sent in reports of damage by this insect to gram and linseed crops. It was noticed also, that especially at Choupa, these caterpillars, after damaging the gram fields started attacking the juar cobs in the surrounding areas.

(iv) *The Juar Grasshopper*.—In Bhongir taluka of Nalgonda District ground grasshoppers were noticed damaging heavily the juar at young stage.

(v) *The Cock-chaffer Beetles on Roses*.—Reports of damage by these beetles to rose plants were received from a number of garden owners round about Hyderabad.

(vi) *The Lemon Butterfly*.—These caterpillars started damaging the foliage of the citrus plants in a number of places like Sangareddy and Patancheru.

(vii) *The Betel-vine Bug*.—Shiraspur and a number of villages round about Hingoli reported damage to betel-vine plantations by this bug.

(viii) *The Cabbage Aphis*.—A number of vegetable growers round about Hyderabad reported severe attack by aphid to their cabbage seedlings.

(ix) *The Melon Fruit Fly*.—The melon cultivation on the river beds of the Musi and the Easi rivers suffered badly by an attack of these insects and as a result there was damage to a large number of fruits.

(x) *Pseudococcus filamentatus on Cotton*.—This insect was noted in a severe form in a number of villages in Sindhur taluka of Raichur District.

(xi) *The Lac Insect*.—The banian trees in the Hyderabad Residency Gardens developed a number of colonies of these insects. As they grew, they indirectly spoiled the lawns below by their exudations.

(xii) *The Tobacco Caterpillar*.—The Tobacco crop of the Sangareddy Experimental Farm suffered badly by an attack of these insects.

(xiii) *The Anar Butterfly*.—Damage to Anar fruits by these insects was reported from a number of private gardens.

(xiv) *Prodenia litura*.—This insect was noticed in pest form during this year in a number of lucerne growing areas round about Hyderabad.

(xv) *Sthenias grisator* on the Grape-Vine.—The grape-vine plot of the Himayet Sagar Horticultural Station suffered badly by an attack of these insects.

5. *Seasonal conditions and their effects on pests of the year*.—During the year under report a great portion of the Dominions received pre-monsoon showers and as a result the emergence of the Red Hairy Caterpillar moths took place rather early. Again, as the first few showers of the south-west monsoon were rather heavy, this perhaps had something to do with the early broods of Castor Semi-looper outbreak, for, it was noticed to be very mild. On the other hand, the absence of heavy rains at the end of the season resulted in a severe outbreak of the pest in a number of places. So the seasonal conditions as prevailed during the year had perhaps something to do with the intensity of this insect occurrence. But, before something definite could be pronounced, records for a number of years would be required. Again, the cloudy weather and heavy winds that prevailed during the time of mango-flowering resulted in a great damage to the crop. The field-rats trouble during the season was rather mild but paddy hispa broke out in a severe form.

6. *Demonstrations and Investigations*.—(a) *The Red Hairy Caterpillar (Amsacta albistriga)*.—The demonstration of control measures against the Red Hairy Caterpillar was continued by the section during the season under report also. The work was spread over the following areas the details of which are given below:—

NARKATPALLI CENTRE (Villages)		JEDCHERLA CENTRE (Villages)		ALIR CENTRE (Villages)
A. Bhongir Taluka	B. Nalgunda Taluka	C. Kalvakurthi Taluka	D. Nagarkarnool Taluka	E. Jangaon Taluka
Valigundah Nagarum Thummalguda Bogarum Ramannapet Chittial	Narkatpalli Pamangundla Doognally Kattangoor Hyatpamala Nakrakal	Gangapur Alwanpalli Rainpet Mannanur Midgel	Marikal Timmajipet Ottum Bijnapalli	Kolpak Pochannapet Buchchannapet. Muztyal Chiriyal

Before the demonstration of the control measures actually started all the villages of the new centres were visited by the staff of the Entomological Section for carrying on the propaganda lectures. Unlike last year the seasonal effect was adverse to our campaign work, for the pre-monsoon showers of 1343 F. were usually heavy, which incidentally caused the hairy caterpillar moths to emerge well before 1st Amardad, from which date the demonstration of control measures started. Though the section was more vigilant this year by starting the work a week earlier, yet it seems as though the pest had outstripped us, the natural circumstances of rainfall conspiring with it. The number of moths collected in the old centres was slightly less than last year, showing a slight decrease in the pest. A statement showing moths and caterpillars picked in the various centres is given at the end of the report. The economics of this campaign are simple and at the same time appear to be sound. Only a small amount was being spent for each village over this work. If this amount were to be distributed over the whole village, it would work out to an almost insignificant figure, taking an average village to consist of 200 agricultural families. Of course, if the cultivators do this as part and parcel of their operations, as they are being slowly induced to do, it would cost them much less. Moreover, considering this preventive aspect of the problem, rather than the control of the pest through employment of costlier insecticides and greater effort and energy, this practice should become slowly a hobby of the village people, especially of the children. The impression produced upon the mind of the agriculturists as a whole by the campaign appears to be good and a number of them, especially in a few talukas, knowing the simple methods of controlling this pest, have started growing over larger areas some of the crops like *til*, previously abandoned for fear of damage by this insect. If the effect of this impression is lasting, then the section may be said to have done its work in this direction. The incentive to co-operative action has kindled to a large extent and it remains to be seen how far this roused up activity is maintained in the years to come and how the pest is dealt with when Government help is withdrawn. No doubt such methods of work are quite new to the cultivators and only continuous effort for some years would make them adopt them slowly.

(b) *The Castor Semi-looper*—(*Achæa janeta*).—The demonstration of control measures for this pest also was continued during the year under report. This work commenced soon after the finishing of the Red Hairy Caterpillar campaign and lasted till 7th of Isfandar 1343 F., extending over the same areas as shown for the Red Hairy Caterpillar. The work was carried on with the help of the temporary kamgar staff sanctioned for this purpose. At the beginning of the season the life-history details of the pest and their control measures, which they would be required to follow, were explained in detail to the cultivators of the campaign villages by the staff of the Entomological Section. During the season under report, owing perhaps to the peculiar weather conditions that prevailed, the outbreak of the early brood was not severe. But during the months of Azar and Dai 1343 F. the later broods broke out in a severe form. As far as possible the affected fields were sprayed. Wherever the spraying was done in time it gave good results and the cultivators were satisfied with the methods of treatment. A summary of the acreage sprayed in the different centres is given in a statement at the end of this report.

In spraying Arsokol was largely used. The result of spraying was noticed to be uniformly good. During this season specially prepared cans for the distribution of the insecticide were popularized. Eighty-one cans were distributed over the various villages. Some of the cultivators are going in for power sprayers also. This work is quite new to them but it is slowly becoming popular.

(c) *Betel-Vine Bug*—(*Disphinctus politus*).—The work on similar lines as during the last year was continued in the betel-vine plot at Jankampet. The manurial experiments for finding out the effect of different manures on the incidence of the betel-vine bug were started in Aban 1342 F. Ammonium Sulphate, Superphosphate and Potassium Sulphate are being tried in different combinations. It is too early yet to say anything definite about the effects of these manures. As for the yield, the *Dudni* variety has continued to give better results than the local ones. A statement is given at the end of the report showing the yield of the manured plots both of *Dudhni* and of local varieties. Regarding

the insect occurrence in the demonstration plot, it has not made its appearance, although it is almost surrounded on all sides by insect attacked gardens.

Besides this bug trouble there was damage especially to betel-leaves by an hairy caterpillar on a large scale during the summer months. The attack was concentrated over a few days only. The betel-leaves were eaten, resulting in characteristic irregular holes, rendering the leaves quite useless for consumption. As the information was received late a study of the pest could not be undertaken this season also.

(d) *The Juar Kadbi Moth*—(*Simplicia robustalis*).—This insect broke out for the first time in pest form in the Dominions and reports of its damage to Juar hay-stalks were received from a number of districts. Caterpillars of the Juar Kadbi moths were responsible for eating away the foliage of the stored kadbi and the damage inflicted was so great that there appeared to be danger of a serious fodder famine. After studying the life-history details of this new pest a circular was issued by the Entomological Section, suggesting simple control measures for checking the spread of the pest.

(e) *The Prickly-pear Cochineal Insects*—(*Dactylopius tomentosus*).—The spread of these insects has been very rapid and quite successful in the Dominions. From the city limits it has gone over a large number of districts in the State. Especially round about Hyderabad, a number of cactus infested sites have been cleared and are being utilized for useful purposes. Within a short period the country-side will present a changed appearance and the cactus itself may become a rare plant.

(f) *The Rice Hispa*—(*Hispa armigera*).—This insect was noted in a bad pest form in a number of districts like Nizamabad, Medak and Gulberga and its activities are seen to be increasing slowly year after year. Both the nurseries and the transplanted crops of paddy are affected. This insect causes damage to plants in two ways. First, the beetle itself feeds on the green matter of the tender leaves producing characteristic, narrow, white streaks on the leaves. Secondly, the young ones of the beetle, which pass their life-cycle in the leaf, burrow into the leaf tissue and eat up the leaf contents. In badly infested plants the leaves lose their green matter and

wither away. Spraying trials with different insecticides were carried out to know a cheap and effective insecticide for controlling this pest.

(g) *The Paddy Stem-Borer*.—(*Schoenobius incertellus*).—The reports of its occurrence as damaging the paddy crop were being received from a number of localities. During the *tabi* season especially the attack started at a very early stage of the crop, and, as a result, the plants withered away. Wherever possible, advice was given for setting up of light-traps with the first appearance of the moths and also after harvest of the crop for ploughing the fields and burning the stubbles. A small leaflet giving the life-history details of the pest and its control measures were freely distributed.

(h) *The Sugar-cane Borer*.—The work of rearing of moths from affected cane sets collected from the Himayat Sagar Main Farm sugar-cane area was continued. The species of borer that predominated was (*Argyria sticticrasis*).

(i) *The Mango-Hopper*.—During the season there was a general occurrence of this insect resulting in great damage to mango inflorescence. So the mango output during the year was very poor. There were a large number of applications for treatment but most of them were received late. However, where possible, the staff of the section itself treated for hopper attack. In other cases, the duster and the necessary insecticide were supplied. Dusting with sulphur with a Peerless duster was seen to give good results. Trials were also carried on with a Blue-bird duster, a smaller type and a handy one, which was seen to work well.

(j) *Field-rats*.—During the season under report trouble from field-rats was not in as severe a form as compared to the two previous years. Wherever possible advice was given for the use of Strychnine hydrochlor baits or fumigation with cyanogas.

(k) *The Mango-Borer*.—(*Batocera rubus* L.).—This is also a very common pest met with in a number of mango gardens. The help of the section was asked for in a number of cases. The attacked trees were treated successfully with chloroform-creosote mixture.

7. *General Collection and Identification of Insects*.—The following insects were reared for mainly incorporating them in the collection, viz.:—(1) *Amasacta albistriga*; (2) *Achæa janeta*; (3) *Deilephila nerii*; (4) *Athalia*

proxima; (5) *Papilio demoleus*; (6) *Chloridea obsoleta*; (7) *Hispa armigera*; (8) *Simplicia robustalis*; (9) *Chilo simplex* and (10) *Argyria sticticraspis*. A few specimens were sent to the Imperial Agricultural Research Institute, Pusa, for identification.

8. *Trials with different Insecticides*.—A number of insecticides like (1) Pysect; (2) Derrisol; (3) Arsinette and (4) Castor-oil emulsion were tried out. Of these Pysect was seen to give good results, especially in cases of aphid attack on roses and vegetables.

9. *Publications*.—The Section issued the following circulars (1) The Juar Kadbi Moth and (2) The Red Hairy Caterpillar and Castor Semi-looper Campaign. The Entomological Assistant also contributed two articles to the Hyderabad Farmer, *viz.*, (1) The Destruction of Cactus by the Cochineal Insects in the Dominions, and (2) A Short Note on Insect Pests and Diseases of Grapevine (under publication).

10. *Popularization*.—The staff of the Entomological Section visited a number of villages and delivered lectures on the Red Hairy Caterpillar and Castor Semi-looper pests. The Section also put up small shows of different insect pests, insecticides and appliances during the annual agricultural demonstrations on the various farms and took a part in a number of *Jatras* and *Urses*.

*Conclusion*.—I wish to acknowledge with thanks the co-operation of the various members of the section both, permanent and temporary, who have helped me in carrying on the work during the year.

(Sd.) A. B. H. KHOORSHID,

*Economic Botanist.*

*H.E.H. the Nizam's Government.*

## STATEMENT I.

*Showing the acreage sprayed for Castor Semilooper in various centres  
(6-11-42 F. to 26-3-42 F.)*

Serial No.	Name of the villages	Period of spraying	AREA SPRAYED	
			Acres	Guntas
1	Gangapur and Alwanpalli ..	16-11-42 F. to 11-2-43 F.	202	11
2	Rainpet and Kothapalli ..	12-11-42 F. to 16-3-43 F.	185	3
3	Midgel and Mannanur ..	6-11-42 F. to 15-2-43 F.	213	2
4	Thimmajipet and Marikal ..	8-11-42 F. to 26-3-43 F.	145	3
5	Bijanapalli and Ottum ..	9-11-42 F. to 26-3-43 F.	189	3
6	Valigundah and Nagarum ..	14-11-42 F. to 18-3-43 F.	242	18
7	Thummalgudah and Rainpet	17-11-42 F. to 14-2-43 F.	90	3
8	Chittial and Narkatpalli ..	16-11-42 F. to 18-3-43 F.	280	14
9	Kattungur and Dugnaully	17-11-42 F. to 14-2-43 F.	142	11
10	Nakrakhal and Hyatpamala	15-11-42 F. to 16-3-43 F.	117	29
	Total ..	..	1,807	71

## STATEMENT II.

*Showing the collection of the Red Hairy Caterpillar moths and Caterpillars in various centres during the season of 1842 Fashi.*

Name of the villages	MONTHS						TOTAL	
	Amardad 1842 F.			Shehrewar 1842 F.				
	Moths	Caterpillars	Moths	Caterpillars	Moths	Caterpillars	Moths	Caterpillars
Gangapur and Alwanpalli	1,285	40,300	..	1,02,500	..	..	1,285	1,42,800
Kothapalli and Rainpet ..	1,044	1,00,618	..	1,36,085	..	..	1,044	2,36,698
Mannanur and Midgel ..	1,700	1,73,852	..	1,15,570	..	..	1,700	2,88,922
Marikal and Thimmajipet	998	23,950	..	5,71,000	..	..	998	6,04,950
Ottum and Bijinapalli ..	2,382	2,801	167	3,88,364	..	..	2,499	3,91,165
Valigundah and Nagaram	1,570	2,775	..	13,460	..	700	1,570	16,985
Ramannapet and Bogarum	2,097	4,053	..	94,506	..	800	2,097	99,359
Chittial & Pamangundlah	1,952	8,650	..	95,082	..	670	1,952	1,04,402
Kattungur and Dugnully..	1,945	8,341	..	27,810	..	426	1,945	86,577
Hyatpamala and Nakrakhal	2,167	8,407	..	23,485	..	400	2,167	32,292
Total	17,090	3,83,242	167	15,67,862	..	2,996	17,257	1,95,400

## STATEMENT III.

*Showing yield of Dudhini and local varieties of Janakempet betel-vine plot.*

DUDHINI VARIETY.

Plot No.	Kind of manurial treatment.		Period for which yield is calculated	Total yield of betel-vine leaves	Income by sale Rs. a. p.
	Dose.	N. 100 lbs. (Ammonium Sulphate) .. P <sub>2</sub> O <sub>5</sub> 100 lbs. (Superphosphate) K. 100 lbs. (Potassium Sulphate)			
1	Ammonium Sulphate + Superphosphate	..	12-1-43 F. to 14-7-43 F.	3,822	2 10 11
2	Ammonium Sulphate + Potassium Sulphate	..	"	3,329	2 3 2
3	Superphosphate + Potassium Sulphate	..	"	2,948	1 11 0
4	Ammonium Sulphate + Superphosphate + Potassium Sulphate	..	"	3,249	2 2 4
5	Control ..	..	"	2,568	1 11 1
6	Ammonium Sulphate	..	"	3,313	2 3 5
7	Superphosphate	..	"	2,987	1 11 6
8	Potassium Sulphate..	..	"	3,397	2 3 9
9	Ammonium Sulphate + Superphosphate	..	"	3,414	2 1 2
10	Ammonium Sulphate + Potassium Sulphate	..	"	2,980	1 13 3
11	Superphosphate + Potassium Sulphate	..	"	3,673	2 4 2
12	Ammonium Sulphate + Superphosphate + Potassium Sulphate	..	"	3,440	2 1 1
13	Control ..	..	"	3,113	1 15 1
14	Ammonium Sulphate	..	"	3,233	2 0 9
15	Superphosphate	..	"	3,394	2 2 4
16	Potassium Sulphate..	..	"	4,255	2 7 1
Total ..				53,115	33 6 6

LOCAL VARIETY.		12-1-43 F. to 14-7-43 F.		
1	Control	..	2,186	1 5 8
2	Ammonium Sulphate ..	..	2,348	1 7 7
3	Superphosphate ..	..	2,453	1 9 5
4	Potassium Sulphate..	..	2,539	1 9 8
5	Ammonium Sulphate+Superphosphate ..	..	1,560	1 6 2
6	Ammonium Sulphate+Potassium Sulphate	..	2,316	1 7 7
7	Superphosphate+Potassium Sulphate ..	..	2,295	1 7 8
8	Ammonium Sulphate+Superphosphate+Potassium Sulphate	..	2,561	1 9 4
9	Control	..	3,196	1 7 11
10	Ammonium Sulphate ..	..	3,218	1 10 2
11	Superphosphate ..	..	3,255	1 11 1
12	Potassium Sulphate..	..	3,106	1 8 0
13	Ammonium Sulphate+Superphosphate ..	..	2,505	1 10 1
14	Ammonium Sulphate+Potassium Sulphate	..	2,832	1 10 11
15	Superphosphate+Potassium Sulphate ..	..	3,469	1 13 11
16	Ammonium Sulphate+Superphosphate+Potassium Sulphate	..	2,448	1 9 2
Total ..			42,287	25 0 4

Total Income from the two varieties ..Rs. 58-6-10.

*Programme of Work of the Entomological Section  
for the year 1343-44 Fasli.*

1. The Red Hairy Caterpillar and Castor Semi-looper campaigns will be continued.
2. The study of the Betel-vine Bug will be continued.
3. Study of the life-history of some of the more important insect pests will be undertaken.

*Annual Report on the Working of the Government  
Cattle Breeding Farm and Dairy, Himayatsagar,  
for the year ending 1342-43 F.*

*Introduction.*—The Cattle Breeding station was established in Thir 1339 F. The first lot of animals was brought in Amerdad 1340 Fasli. By the end of the official year Malvi cattle and Murrah Buffaloes were added to the herd.

*Situation.*—The farm is situated on the Hyderabad-Himayatsagar Road and is about 6 miles from Charminar, 8 miles from Broad gauge and 11 miles from metre gauge stations.

*Object.*—The object is to improve draught cattle for Telengana by selective breeding. Milk yield is also kept in view in selection so that the milking capacity of the cow may not be sacrificed unnecessarily.

In short this farm is an institute for (a) the establishment of pedigree herds (b) to distribute seed bulls to breeders and (c) to demonstrate to the public the handling and distribution of milk and its products on up-to-date scientific lines with modern Dairy appliances.

*Charge and Establishment.*—The undersigned was in charge of the farm throughout the year. He was on privilege leave from 9th Thir 1341 Fasli to 10th Amerdad 1342 Fasli. During this period Mr. Abul Haq, Assistant Superintendent acted on the post of Superintendent, Mr. Abdul Haq continued in the post of the Assistant Superintendent. Accountant Hyder Khan Sahib was on leave from 1st Amerdad 1342 Fasli to end of Bahman 1343 Fasli; 3rd grade clerk Mohamed Khan Sahib acted in this vacancy.

*Breeding Herd.*—At the beginning of the year the herd consisted of 39 Krishna Valley cows, 34 Malvi and 15 she-buffaloes. During the year 18 Krishna Valley cows were purchased at Kudchi and added to the herd. The herd at the end of the year was 52 Krishna Valley, 30 Malvi and 12 Murrah Buffaloes,

*Bulls.*—During the year 3 bulls of Krishna Valley as against 2 of the same breed during the previous year, 2 Malvi and 1 bull buffalo were kept for breeding purposes. One bull of Krishna Valley breed was purchased from open market during the year. Statement No. 1 gives details of herd strength.

*Health of live-stock.*—The herd kept good health on the whole during year under report.

*Contagious Diseases.*—Black quarter broke out at the break of monsoon and was responsible for few deaths.

*Castrations.*—Five bull calves were castrated during the year as these were not of desirable type and colour.

*Births and Deaths.*—Sixty-one calves were born during the year and 39 deaths were recorded. The high mortality was mainly due to the Black quarter epidemic which was responsible for 10 deaths amongst calves. Eight animals which reacted for tuberculosis were destroyed. One calf was killed by wild animal.

*Coverings.*—Thirty-eight Krishna Valley cows, 23 Malvi cows, and 11 buffaloes were covered during the year. Full details are shown in table No. 3.

*Regulating Calvings.*—In order to ensure a regular milk supply a system has been adopted whereby it is made possible to have at least 50 per cent. of the herd in milk allowing for fluctuations and drying of cows.

### *Dairy Section.*

The principle object of this section is to demonstrate to the public clean milk production and handling of milk and milk products with modern dairy appliances.

The dairy building is located on a high elevated site commanding a good view of almost the whole estate. The Main Dairy room is made completely fly proof, in it are installed the Pasteurizer, cooler, cream separators, butter churn, etc.

The pasteurizer is of coil type. The milk is pasteurized twice daily and the cows and buffaloes milk are pasteurized in separate batches. The heated milk after being held for half an hour is pumped on the cooler. At the lower end of the cooler down goes the temperature of the milk from 145° to 40° and one sees the cool milk received in cans.

All bottling and capping are done with hand operated machinery. In the east end of the Dairy room is the cold store with a floor area of 165 sq. feet. A temperature of 40° to 45° is always maintained in this room; in it are stored the pasteurized milk, butter, cream, etc. The temperature of the cold store is regulated through the ammonia compressor with brine as cooling medium.

The wash-up room is equipped with bottle sterilizing cabinet and a steam block. In this room all bottles, cans and other dairy utensils are subjected to live steam after being cleaned with cold and hot water.

A 10 H.P. vertical cross tube boiler is another important piece of equipment. It is the power unit for the working of all the machinery and for supplying hot water and steam for washing, etc.

*Milking Sheds.*—On the north of the Dairy building the cows are milked in modern dairy milking sheds. Each shed is designed for 60 cows in stanchions and there are two large calf pens with large paddocks, attached to them. The stable floors are cement and the stanchions and stall partitions are of iron. The sides of the sheds are open thus keeping the air fresh and sweet and allowing plenty of sunshine.

*Milk recording.*—The first and most important step in keeping herd record is the daily weighing of milk from each cow or as is otherwise known "Cowtesting." This testing provides:—

1. An accurate guide for feeding grains.
2. Any abnormal condition in the cow, such as approaching illness, off feed or a sudden drop in milk flow as shown in the milk record register.
3. Shows at a glance how persistent each cow is in keeping a uniform heavy yield over a long period of time and lastly.
4. The sheet serves as an excellent guide in culling unprofitable cows.

In view of the above facts regular milk recording was done during the year. Details of milk yield and its disposal is shown in table number 6.

*Standard.*—At present a standard of 2,500 lbs. of milk for a Krishna valley cow and 1,500 lbs. for Malvi for a lactation period of 9 months has been fixed. There are few cows in each breed which have far excelled these standards.

*Medical Inspection.*—Gowalas and Dairy boys were medically examined by Captain Tarapore.

### *Cultivation.*

The farm is made up of 464 acres of which 300 acres are reserved for grazing, 62 acres are under canal irrigation, 60 acres are under dry cultivation. The remaining 42 acres are occupied by roads, buildings, paddocks and toddy grooves.

The dry area is typical of red chalka soil and only kharif crops are raised.

Wet area is made up of medium black soil and almost the whole area is irrigated by gravitation from Haidari channel.

*Crops.*—All the agricultural work done on the farm is done with bullock power.

Only Karif crops were raised in the dry area. The soil being poor cereals and lengunnious fodder were the chief crops raised. From experience it was found that even heavy dosing of compost did not go a great way to improve the soil. Recourse was therefore taken to green manuring rotation with sun-hemp. This has served the dual purpose of fertilising and supplying fodder to a small degree.

In wet area 2 crops were raised during the year. Varieties of fodder, juvar like nilwa, sundia, yellow local, impi, maize, oats, cow-pea, kulthi and gowar were harvested. Most of these were fed green; a portion of it was ensilaged and some was turned into dry kadbi after collecting seeds.

3 Acres each of Alfalfa and Berseem was raised. Guinea grass was also sown on a small plot. The plot on which Berseem was grown in succession for the 2nd year as per Mr. Burt's advice, was also inoculated with Berseem culture. This resulted not only in harvesting excellent crop but has improved the fertility of the soil to a considerable degree.

*Experiments.*—Experiments were carried out by growing Berseem in both inoculated and uninoculated soil. The results conclusively proved that Berseem does very well on suitably inoculated soil. Berseem has come to stay on the Farm as a rotational crop. Efforts are being made to raise Berseem seeds on the farm.

*Grazing area.*—Details of yield, etc., are shown in Table number 5—The soil of this area is poor and nearly one-eighth of it hilly. Spear grass (*Audropogan Contortus*) forms the chief variety of grass. Seeding of better varieties of grasses such as Pounia, Marvel, and Seda got from Hingoli, Bidar, and also collected from the suburbs of Hyderabad was done during the year. Out of the 3 varieties sown there was poor germination of Pounia. The other two grasses did well and are likely to spread.

*Paddocks.*—There are 8 paddocks. Out of these 4 were reserved for harvesting hay and the remaining 4 were used for grazing in rotation. These paddocks provide grazing for about 8 months in the year. Part of these being hilly afford excellent exercise for the young stock. Shade trees planted in paddocks are progressing well.

*Silo.*—Two pits were filled during the year. They were opened and fed in May. These along with the one pit of the previous year supplied succulent fodder during the summer months.

*Permanent Improvements.*—Plotting of fields were completed. In wet area 3 acre plots were laid out. These plots measure  $270 \times 484$  ft. 4,462 feet of twenty feet wide road was opened during the year under review. This length together with 1,200 feet of last year fully commands the whole of the wet area. Eight culverts were built on these roads. Some are for draining the plots and some for irrigating the plots.

*Drainage.*—Open drains of two to four feet deep have been cut on the sides of almost all the plots. The tank bund has been breached in two places which provide outlets for the drainage of almost the whole of the wet area. Water-logging has thus been overcome with the natural result of a greater area, *viz.*, 45 acres having been brought under cultivation as against 30 acres, in the previous year. It is hoped to reclaim the remaining 17 acres during the next year.

Two wells and two ditches were filled up.

Levelling was done in plots 3, 7, 8, 12, 13, 14, 15, and 17 in wet area.

*Farm Bullocks.*—The strength of the farm bullocks was increased from 7 to 12 pairs to cope with the extra work caused by the increase of area under cultivation.

*Compost Factory.*—There are 22 pits in the factory. Seventy pits of compost were manufactured and utilised during the year.

*Implements and Machinery.*—No new implements or machinery were purchased during the year under review. All implements kept in good working order. Few spares were purchased as necessity arose; wooden seed drills and harrows were made on the farm.

*Demonstrations.*—Demonstrations were held on 22-1-1343 and 1-5-1343 F. These have served as promotion media to arouse interest in quality milk and milk products and to attract public attention the Cattle Breeding and Dairy Industry in a way which has not been previously been attempted in Hyderabad. Visitors were taken round and shown Pasteurization, Butter-making, Cream-separation, Milk-testing, etc. Visitors viewing the 30 feet or thereabouts journey of the milk from the Pasteurizer to the milk bottling machine were impressed with the mode of handling of milk and with the modern machinery installed to safe-guard their health.

*Electric Installation.*—Electric power comes from an individual plant which has been in continuous operation since it was installed. The plant for the present is used to furnish lights. The installation comprises of 10 B.H.P. Duetz crude oil engine with generator for generating 5 Kilowats.

*Income.*—By sale of Dairy produce a sum of Rs. 9,979-3-10 was realised and credited during the year under review. Details of Dairy produce and their disposal are shown in statement No. 6. A sum of Rs. 742 was realised by sale of 2 cows, 1 buffalo and 7 calves. The total income during the year thus amounts to Rs. 10,721-3-10.

*Visitors.*—A visitors book was opened on 11th Aban 1342 Fasli. 501 visitors visited the Farm from then to the end of the year. The following visitors were some of the most distinguished, amongst them:

1. Nawab Salabath Jah Bahadur.
2. Nawab Basalath Jah Bahadur.
3. Count Baron Omar of Austria.
4. Sir Richard and Lady Trench.
5. Nawab Akil Jung Bahadur.
6. Col. Norman Walker.

*Brick Licks.*—To balance the deficiency of minerals in roughage mineral bricks are supplied to the stock.

*Conclusion.*—The undersigned records his appreciation of the whole-hearted co-operation of the staff and their devotion to duty and honest work.

The undersigned is grateful to the Director, Mr. Nizamuddin Hyder, for the ready help and guidance given to him at all times.

V. S. RAMA RAO,  
*Superintendent, C. B. F.*

## I.

*Statement showing the number of cows and buffaloes in Milk for the year  
1342 F. to 1343 F.*

Se- rial No.	Months	K. Val- ley Cows	Malvi Cows	Murrah Buffaloes	Total of Animals	Re- marks
1	Amardad 1342 F.	20	19	5	44	
2	Shehrewar „ ..	17	18	3	38	
3	Meher .. „ ..	18	17	5	40	
4	Aban „ ..	18	14	6	38	
5	Azoor 1343 F.	19	15	6	40	
6	Dai „ ..	18	16	9	43	
7	Bahman „ ..	13	12	8	33	
8	Isfandar „ ..	13	10	9	32	
9	Farwardi „ ..	13	11	9	33	
10	Ardibehisht „ ..	14	12	8	34	
11	Khurdad „ ..	15	13	6	34	
12	Thir „ ..	34	13	6	53	

*Birth and death statement for the year 1342 F. to 1343 Fasl.*

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*Covering statement for the year 1342 F. to 1343 F.*

Serial No.	Months	KRISHNA VALLEY		MALVI		Murrah Bull Son of Dhar.	Remarks
		Sarang	Khalifa	Changez	Reddy		
1	Amardad 1342 F. ..	3	4	1	..	1	
2	Shelhrewar .. ..	2	1	1	1	1	
3	Meher .. ..	1	1	2	..	..	
4	Aban .. ..	..	..	..	..	..	
5	Azoor 1343 F. ..	1	3	2	1	2	
6	Dai .. ..	3	1	1	..	2	
7	Bahman .. ..	1	..	1	1	..	
8	Isfandar .. ..	1	..	2	2	3	
9	Farwardi .. ..	2	2	2	..	2	
10	Ardibehisht .. ..	..	..	3	..	..	
11	Khurdad .. ..	3	1	1	..	..	
12	Thir .. ..	3	5	2	..	..	
	Total ..	20	18	18	5	11	

Statement showing the addition and decrease in the year 1342 and to 1343 Fashi.

Breed and class of Animals	Balance on 1st Amard. 1342 F.	Purchase	RECEIPTS BY			Total of 2 & 6	OUT-GOING				Balance on 31st/Thir 1343 F.	Remarks
			Births	Trans-fer	Total of 3, 4, & 5		Death	Sale	Trans-fer	Total of 8, 9 & 10		
I	2	3	4	5	6	7	8	9	10	11	12	13
<i>I.—Krishna Valley.</i>												
(a) Stud bulls	2	1	..	..	1	3	..	2	..	..	3	*Cows received from:
(b) Cows	39	*18	..	..	18	57	3	..	..	5	52	Kudchi on 28-7-43F.
(c) Bull calves	28	..	11	*6	17	45	5	3	..	8	37	*Calves rec'd with
(d) Cow calves	18	..	20	*7	27	45	8	..	..	8	37	cows on 28-7-43 F.
<i>II. Matvi.</i>												
(a) Stud bulls	2	..	..	..	..	2	..	..	..	..	2	* do do
(b) Cows	34	..	..	..	..	34	4	..	..	4	30	
(c) Bull calves	22	..	7	..	7	29	1	5	..	6	23	
(d) Cow calves	31	..	11	..	11	42	6	..	..	6	36	
<i>III. Murrah.</i>												
(a) Stud bull buffalo	1	..	..	..	..	1	..	..	..	..	1	
(b) Buffaloes	15	..	..	..	..	15	2	1	..	3	12	
(c) Bull calves	4	..	1	..	1	5	1	..	..	1	4	
(d) Heifers	9	..	11	..	11	20	9	..	..	9	11	
<i>IV. Farm Bullocks.</i>												
	14	10	..	..	10	24	..	..	..	..	24	
Total	219	29	61	13	103	322	39	11	..	50	272	

Statement showing farm product and its consumption for the year 1342-43 Fasli.

Serial No.	Particulars	QUANTITIES IN lbs.			Total	Expenditure fed to cattle	Balance
		Balance from last year	Yields of 1342-1343 F.	Purchased			
			<i>Dry Fodders.</i>				
1	Hay ..	1,90,284	2,79,533	1,60,977	6,80,794	4,76,398	1,54,396
2	Dry kadbi ..	17,445	30,750	..	48,195	48,195	..
	Total ..	2,07,729	3,10,283	1,60,977	6,78,989	5,24,593	1,54,396
			<i>Green Fodders.</i>				
3	Green grass ..	..	1,23,138	..	1,23,138	1,23,138	..
4	Green jowar with cow pea kulthi, etc. ..	..	1,88,529	..	1,88,529	1,88,529	..
5	Lucerne ..	..	51,141	..	51,141	51,141	..
6	Berseem ..	..	1,08,802	..	1,08,802	1,08,802	..
7	Gimica Grass ..	..	3,765	..	3,765	3,765	..
8	Oats ..	..	28,662	..	28,662	28,662	..
9	Maize ..	..	24,907	..	24,907	24,907	..
10	Gawar ..	..	1,800	..	1,800	1,800	..
11	Silage ..	54,675	68,443	..	1,23,118	1,23,118	..
	Total ..	54,675	5,94,187	..	6,48,862	6,48,862	..
			<i>Fodder Seeds.</i>				
12	Nilwa Jowar ..	..	385				
13	Sundhia Jowar ..	..	660				
14	Impi Jowar ..	..	783				
15	Yellow Jowar ..	..	975				
	Total ..	..	2,803				

## Dairy Statement from 1st Amardad 1342 F. to 31st Thir 1343 F.

## MILK

Serial No.		Name of the months		RECEIPT						Total		DISPOSAL									
				Cows		Buffaloes		Purchased buffaloes				Fed to cows		Loss		Separation		Cows sale		Buffaloes sale	
				lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.		
		Amardad	..	8,540	8	2,269	8	1,132	8	11,942	8	4,271	8	263	..	417	..	4,950	..	2,010	..
2		Sherewar	"	7,188	..	1,430	8	1,636	..	10,254	8	3,076	..	182	12	246	12	4,575	..	2,205	..
3		Meher	"	6,219	..	2,322	8	851	..	9,392	8	2,694	8	206	..	752	8	3,744	8	1,929	..
4		Aban	"	5,422	8	3,126	8	..	..	8,549	..	2,499	..	197	..	430	..	3,652	8	1,833	8
5		Azur 1343F.		6,577	8	3,168	8	..	..	9,746	..	3,021	..	197	8	1,156	..	3,448	8	1,912	8
6		Dai	"	5,767	..	3,844	8	..	..	9,611	8	2,992	8	226	..	1,045	..	3,501	..	1,854	8
7		Bahman	"	5,365	8	3,804	8	..	..	9,170	..	2,294	..	201	8	1,047	8	3,768	..	1,863	8
8		Isfandar	"	5,399	8	4,037	..	..	..	9,436	8	1,934	..	172	..	1,304	8	3,703	8	2,290	..
9		Farwardi	"	6,677	8	3,854	8	..	..	10,532	..	2,404	..	226	8	1,570	8	4,086	8	2,252	..
10		Ardebilist	"	8,167	8	3,097	..	..	..	11,264	8	2,702	..	263	8	1,824	..	4,230	8	2,150	8
11		Khurdad	"	9,065	8	2,341	..	..	..	11,406	8	2,784	..	210	8	2,553	8	3,962	8	2,004	8
12		Thir	"	14,392	8	2,133	8	..	..	16,526	..	5,529	..	224	..	5,569	..	3,428	8	1,750	..
		Total	..	88,782	8	35,429	8	3,619	8	1,27,381	8	36,201	8	2,570	4	17,916	4	47,051	..	24,055	..



*Programme of Research Work at Himayatsagar Cattle Breeding Farm, for the year 1343-44 Fasli.*

1. Breeding and selection of cattle of Malvi and Krishna Valley breeds will be continued.
2. The available seed bulls will be distributed to breeders of cattle.
3. Supply of pasteurised milk will be continued.
4. Experiments with different kinds of fodders will be continued.

*Annual Report of the Government Poultry Farm,  
Himayatsagar, Hyderabad, for the year  
1342-43 Fasli.*

1. *Introduction.*—The farm was started during the Winter of 1340 F. (December 1930) as a result of the Poultry Survey of H.E.H. the Nizam's Dominions.

2. *Situation.*—The Poultry Farm is situated in the area of the Main Agricultural Experimental Farm, Himayatsagar, which lies on the Hyderabad—Himayatsagar road at a distance of 9 miles from the Broad Gauge and 12 miles from Metre Gauge Railway Stations of Hyderabad Town on H.E.H. the Nizam's Railways.

3. *Object.*—Main object of the Farm consists in finding out a suitable breed for the climate of the Dominions, and to demonstrate the improved methods of Poultry raising.

4. *Breeds.*—Four pure breeds namely White Leghorns, Rhode Island Reds, Australorps, and Hyderabad Aseels are maintained on the farm. In addition a pen of selected local birds started during the previous year is also being maintained with the object of evolving a country breed capable of serving the dual purpose of egg laying and table use.

(a) *White Leghorns.*—There were 2 cocks, 14 hens, and 56 chickens on the farm at the beginning of the year under review. During the year 16 cockerels and 9 pullets bred on the farm were added to the adult stock; and 89 chickens of this breed were raised on the farm.

Out of the adult stock 4 cocks and 2 hens were sold, 2 cocks and 3 hens died of disease, and there were 86 deaths in the chickens. So at the close of the year there were 12 cocks, 18 hens and 34 chickens on the farm.

The adults kept in a fairly good health. The chickens however were badly attacked by chicken-pox, Roup, white diarrhoea and coccidiosis.

(b) *Rhode Island Reds.*—At the beginning of the year there were 3 cocks, 16 hens, and 39 chickens. During the year 13 cockerels and 22 pullets bred on the farm were added to the adults stock; and 154 chickens were raised on the farm.

Out of the adult stock 3 cocks and 2 hens were sold, 3 cocks and 12 hens died of disease, and there were 120 deaths in the chickens. So at the close of the year there were 10 cocks 24 hens and 38 chickens on the farm.

General health of the stock has been fair but they are fading in colour probably due to comparatively open surroundings. Four of the adult birds died of heat stroke. The chickens were attacked by chicken-pox, Roup, and a white diarrhoea; which diseases were responsible for a large number of deaths in them.

(c) *Australorps*.—There were 2 cocks, 9 hens and 21 chickens at the beginning of the year. During the year 6 cockerels and 20 pullets bred on the farm were added to the adult stock; and 73 chickens were raised on the farm.

Out of the adult stock 1 cock and 11 hens died, and there were 28 deaths in the chickens. So at the close of the year there were 7 cocks, 18 hens and 40 chickens on the farm.

The birds maintained fairly good health throughout the year. Five of the adult birds died of heat.

(d) *Aseels*.—At the beginning of the year there were two pairs of adult birds. 4 chickens were raised during the year. One cock and 2 hens died during the year, so only one cock and 4 chickens were left at the close of the year.

The breed is rather difficult to rear.

(e) *Selected Mongrels*.—Originally 2 cocks and 5 hens of barred type were selected from the country fowls in the previous year; and out of the chickens raised on the farm only 2 proved to be true to type. These two chickens grew adult during the year and proved to be a pair. So these were added to the adult stock.

Out of the eggs laid by these birds only 35 chickens hatched out. Out of which 25 died of various diseases the chief out of them being white diarrhoea. Out of the remaining 10 only 2 proved to be true to type and were kept, the remaining 8 were discarded.

At the close of the year there were 3 cocks, 6 hens and 2 chickens of this type on the farm.

5. *Laying Record*.—The Poultry Fieldman was undergoing training at Patancheru for a period of six months during the year under review and therefore it has not been possible to collect any interesting data.

6. *Breeding*.—One Hearson's Incubator of the capacity of 60 eggs is kept on the farm and put to use. During the year under review 617 eggs were set in the machine out of which 267 chickens were hatched. 104 eggs were set under country hens out of which 22 chickens hatched out. 346 eggs were lent on half partnership to various breeders, out of which the farm got 66 chickens as its share of hatching.

Total hatching of the various breeds during the year under review are shown in the following statement:—

Breed	Incubator		Settings under hens		Half partnership	
	Eggs	Chickens	Eggs	Chickens	Eggs	Chickens
White Leghorn ..	189	69	10	..	198	20
Rhode Island Reds ..	199	109	16	6	124	39
Australorps ..	149	63	12	8	24	7
Aseels ..	6	2	14	2	..	..
Selected Mongrels ..	74	24	52	11	..	..

7. *Diseases and Deaths*.—Chicken-pox, white diarrhoea, roup, and coccidiosis have been responsible for most of the deaths in the chickens. The following statement shows the deaths under each disease:—

Breed	NUMBER OF DEATH IN CHICKENS DUE TO					
	Chicken-pox	White diarrhoea	Roup & cold	Coccidiosis	Other maladies	Total
White Leghorns ..	25	12	7	10	32	68
Rhode Island Reds ..	44	22	14	7	33	120
Australorps ..	4	4	3	..	17	28
Selected Mongrels ..	2	12	3	1	7	25

The following statement shows the deaths of the adults under each disease:—

Breed	NUMBER OF DEATHS IN ADULT BIRDS DUE TO						Total
	Green d'arrhoea	Heat stroke	Roup	Anæmia	Cocci- diosis	Other diseases	
White Leghorns	2	..	1	2	..	..	5
Rhode Island Reds.	2	4	..	2	3	4	15
Australorps ..	2	5	3	..	..	2	12
Aseels ..	1	..	..	..	..	2	3

8. *Apparatus, etc.*—The following new articles were purchased and put to use during the year:—

Automatic grain feeders	..	12
Putnam brooder heater ..	..	1
Wing bands ..	..	300
Leg bands ..	..	600
Weighing balance	..	1
Egg weighing scale	..	1
Pedigree bags ..	..	14
Pedigree cage ..	..	1

9. *Runs and Houses.*—Remodelling of the poultry runs was started towards the close of the year. Originally the runs were narrow and long with the result that the birds could have longer access on one side only. The present remodelling is started with the object of widening the width of the runs and decreasing the length so as to give a good fairly square shape.

10. *Finances.*—The expenditure during the year under review amounted Rs. 2,378-1-2 and the income was Rs. 67-7-4.

11. *Charge and Establishment.*—In the absence of the Poultry Fieldman Mr. Deshmukh, who was undergoing training at Patancheru, Mr. Sitaramaiya, carried out the routine duties from the beginning of the year under review to the end of Dai 1343 F., when he was relieved by Mr. Deshmukh who worked for the rest of the year.

12. *Miscellaneous*.—Poultry Shows were arranged in the Agricultural Demonstrations held on the farms and also in the Horticultural and Poultry Show at Hyderabad.

Advice on various matters is always freely given to all the interested in the industry.

A. SOOFEE,  
*Deputy Director of Agriculture,*  
*Western Telingana Division,*  
*Himayatsagar,*  
*Hyderabad-Deccan.*

*Programme of work of the Himayatsagar Poultry Farm,  
for the year 1343-44 Fasli.*

1. Comparison of White Leghorn, Rhode Island Red, Australorp and Hyderabad Aseel breeds of fowels with regard to their hardiness and productivity.
2. Selection in the country fowl.

*Annual Report of the Horticultural Station, Himayatsagar Main Experimental Farm, for the year 1342-43 F.*

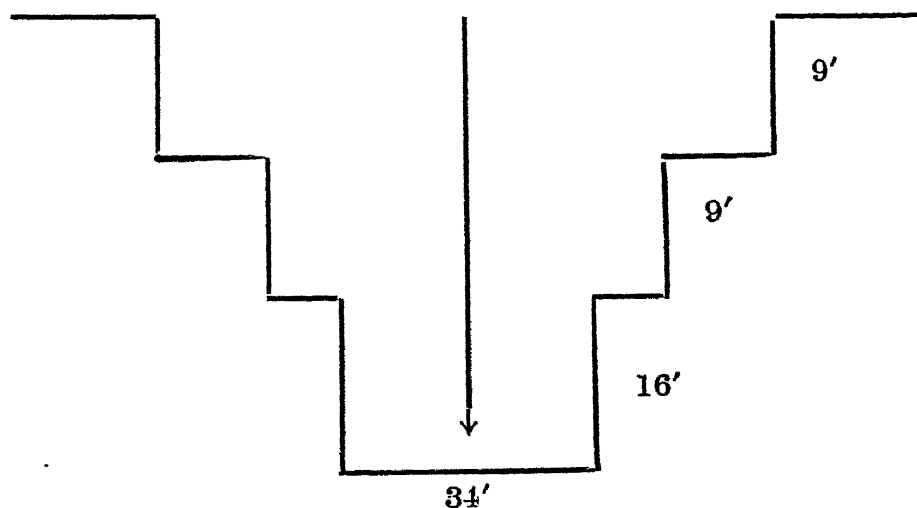
*Situation.*—In the Telenganah Western Circle this is a central Horticultural Station on the main experimental farm. It is situated along the Eastern boundary of the Farm on the first Main Road, which is connected to the south with the Mir Alam-Himayatsagar Public Road.

*Object.*—This Horticultural Station will serve demonstration and experimental purposes. Different fruit crops are being tried under the improved methods. Experiments are being made by introducing foreign varieties and their behaviour is marked under our climatic conditions. In case they are proved to be as prolific as they are known at the places of their origin on the same stock they can readily be introduced in the country. While some of the foreign varieties fail to satisfy us with their all well-known qualities they will be tried on different stock of acclimatized varieties or on different plants of the same order to achieve the object.

*Soil.*—Since the soil of the garden area does not actually meet our requirements excepting chalka area, to improve the soil conditions both in the higher sandy area and in the lower clayey area a crop of sunn-hemp was grown in plot 31, 33, 34, 40-47 and ploughed in towards the close of August. In the fig plot udid was grown as green manure and ploughed in after about 2 months.

*Area.*—Besides the 8 acres of the garden area which we had for demonstration and experimental purposes in the later part of the year under report, it has been extended by the acquisition from the main farm of an area of about 2 acres comprising plot 29 and 30 lying adjacent to our plot numbers 31 and 32. The idea is to establish on this area, if possible, a nursery on a fairly large scale to meet the demand of some of the districts of the Western Telenganah Circle.

*Irrigation.*—Above all these a serious attempt is in progress to make the water supply which has in spite of all trials in the past years been only partially effective, abundant and assured. Keeping in view the ever existing possibility of getting the canal water into the well, arrangements are being made to deepen the well and enhance its capacity to make it, if possible, quite independent of the canal. This is desirable for various reasons. While the canal water was good in itself and was available in plenty, yet it brought in its train a plentiful supply of weed seeds especially weeds of *Cyperus rotundus* that the land is already infested with and in the absence of any device for filtering it, only helped to make the land bad as it is the more so. A cross section of the well as it is at present is as follows:—



Though the work is not complete yet we have struck some good currents of water and now at the climax of the hot weather when usually there is a general scarcity of water, we get a supply of water 8 ft. high during the course of 24 hours over an area 54'  $\times$  21'. If funds allow we mean going 3 ft. more and expect an even better response.

Side by side with the above arrangement for an adequate supply of water no effort has been spared to provide for efficient haulage and carriage of water to the different plots. A tank standing 23 feet above the ground near the well has been put up for making it possible to irrigate the higher area right up to the extreme southern boundary of the section. A new 10-H.P. engine (Rustons) has been purchased to manage the haulage.

*Rahat*.—In addition to this we are also trying to provide a rahat of local manufacture for the lower area with a view to cut down the cost of irrigation by means of the pumping plant at least as long as there is during the greater part of the year a possibility of working it efficiently. If every thing turn out as we are being led to expect the problem of water supply and irrigation will have been once for all settled with the completion of the well work progress.

*Ornamental Section*.—Except cultivating a few annual flower the station was not taking any serious interest in this branch of horticulture. A forward step was however, taken this year in this direction. A collection of flowering and foliage shrubs, palms and ferns was purchased and the area in front of the store in plot 40 was laid out with a lawn surrounded by a shrubbing of foliage and flowering shrubs.

*Manure*.—Good manure, as noted before, is difficult to procure and hence supplements what we do get we are continuing to run the night soil, leaf mould and poultry manure pits. These are naturally proving a great help.

*Fruit crops in the station*.—Mango area. Though every effort seems to have been made to secure reliable plants a few plants in our mango plantation have not turned true to name the incorrigible "Totapuri" in every case. This variety and a few mulgoa plants and the "Petto" a variety obtained from Bandlaguda nursery have fruited this year.

2. *Cashew-nut* (Kaju), (*Anacardum Oecidentale*), a few plants were raised from seeds obtained from Travancore through a friend of mine and planted in the mango area by way of trial. Though it is hardly 2 years since these were put in, one of them flowered this year and bore two fruits.

3. *Chikoo*.—(Plot 38). The plantation is thriving and most of the plants of both the varieties—the round and the long have borne fruits. The trees are about 6 ft. high now.

4. *Grapes*.—(Plot 38). Out of the varieties under trial 1—the Abi or Bhokri, 2—the Fakri, 3—Sahebi, 4—Habshi, 5—Malta (Gulbarga), 6—the Bangalore White, 7—Bangalore purple and 8—Khandhari. Nos. 1,

2, 8, 6 and 7 bore a few bunches last season (Metha Bahar). All the plants have been given the summer pruning in April and preventive spraying with Bordeaux mixture are being given to save the plants from fungus and insect attack. One serious pest—the Girdler (*Sthenia Grisator*) gave us for a few weeks a very anxious time of it. Four sturdy vines were damaged before we were any the wiser. Through “search out” of the attacked and neighbouring vines however after we noticed the loss, resulted in the capture of eight adult beetles and after this there was no fresh attack.

5. *Pine-apples*.—(Plot 38). Our first trial plantation of this fruit as already reported in previous years commenced in 1340 Fasli. About 200 suckers of the Singapore Queen variety were got out from the Government Farm, Kalimpong, Darjeeling and planted in the month of June after the monsoon rains had fairly set in, 3'×2' apart in pits 6 inches deep. The plants were later earthed up. The plants grew fairly satisfactory but only one solitary fruit appeared after a lapse of a year and a half and more. So early in 1342 F. in the month of Azur when the rains were over a second lot of suckers of two varieties Queen and Spineless Kew were got out from the same place and planted in the neighbouring area, this time on ridges 3 feet apart, the plants standing 2 ft. apart in the same row. Owing evidently to the change both in the mode of planting as well as the season, the plantation given otherwise almost the same treatment as the previous one, grew very vigorously and in the month of Ardibehisht quite a number of plants began to flower and these have now been harvested. Though owing to existing circumstances it was not possible to grow the plants under perfectly controlled conditions the response has been fairly satisfactory which indicates the possibilities this fruit has in Hyderabad given good soil, necessary shade during the severe weather obtaining during the months of March, April and May, and proper cultural treatment. The temporary Chapper provided for shade in the past year was replaced by a crop of sunflower and gave quite good result. Plant growing under the shade gave perfect fruits while those exposed got scorched by the sun on the side exposed—(West). Of the two varieties under trial *i.e.*, Queen and Spineless Kew the former behaved better and gave uniformly average size fruits.

6. *Guavas*.—(Plot 38). The guavas are getting on quite nicely. All are bearing and out of the fine varieties under trial, the Safeda, Habshi and Seedless are very promising and seem quite desirable varieties for introduction to replace the prevailing ones. Grafts from the above varieties will be taken during the coming season as well as seedlings raised for sale or distribution.

7. *Figs*.—(Plot 36). The plantation unfortunately seems quite out of place. The soil is heavy, under-drained, and almost half of it full of "Choud." They do not appear to get on very happily though every effort is being made to ameliorate the existing adverse conditions. It will be some time before the land becomes quite fit. The borer "*Bapcera Rubra*" has again destroyed a few plants and the fruit crop was again considerably damaged by an attack of mite on the leaves and fruits. The scale insect which appeared during last year was however kept in check by repeated washings with hot oil soap and now the plants are quite free from it.

The Mediterranean variety (Black Ischia) continues to grow more vigorously than the other varieties but it also seems not to be quite resistant to "Choud" conditions as the plants in the Choud area are not as vigorous as the others.

8. *Citrus*.—(Plot 36). Varieties: Washington Navel-Mosambi—and Grapefruit.

The plantation except a few of the grapefruit plants has so far not been given any regular treatment for any Bahar. A few plants however of mosambi, and washington navel have commenced to a few fruits. The grapefruit plants were some of them forced to flower by ringing a few promising branches and quite a number of fruits were harvested.

9. *Plantains*.—(Plot 32). Misfortune seems to dog the footsteps of all attempts to grow a variety of this fruit at the station. About  $\frac{1}{2}$  an acre in plot 32 was done up in ridges and trenches as reported already and a number of varieties collected from various sources was planted on the ridges 10 feet apart, but again the inadequacy of facilities for irrigating it during the hot

weather then the well failed us absolutely resulted in a serious disappointment. The only course left for us was to sow the seed by transferring the surviving sucker to the nursery. We hope to start again with better equipment in the near future after the completion of our well work.

*Date.*—The dates are progressing fairly well, one plant flowered and the inflorescence was artificially pollinated by our Date Expert. A few fruits appeared but dropped off later. To improve the drainage conditions further small drains have been opened along each line of trees.

*Papaya.*—This is doing splendidly in the upper chalka area plots 38 and 39. In the lower area plants made a feeble growth but sickened and dead during wet months. Both the varieties—Guzerat and Washington are doing equally well. In fact Hymayatsagar station has acquired a small reputation for its good Papayas. As we have never grown this in a regular plot on a field scale, the problem of unfruitful male trees has not appeared. We are, however, making an experiment with the few male trees that we have to see if beheading the male trees help to convert them into females as has been the experience else where. One such male plant was treated thus last year but all the new shoots that have sprung up below have borne only male flowers again. The subject however is interesting and every opportunity will be taken to carry on this experiment.

*Betel-vine.*—The pan mala in this section was started with the object of finding out if a change of the local method of planting (as at Jankanpet) where the plantations owing to dense shade and absence of free movement of air made them susceptible to the attack of the beetle-vine bug, would have any salutary effect. The result so far as the object of the experiment was concerned has been very satisfactory the change being the adoption of the Poona method of planting. There are two plots, one situated a little higher than the other providing a slight difference in the drainage conditions. The higher-plantation is in a fairly good condition but the lower one with less satisfactory drainage has many gaps. Drainage facilities provided. This plot also is sure to improve.

## IV. VEGETABLES.

With the water supply not assured, no attempt was made to experiment with a variety of vegetables. A small area was however grown in No. 40 and in the citrus plot as a rub-crop. The former area had at the latter part of its life to be abandoned owing to inability to irrigate it.

*Potato* (Phulwa).—Seed saved from last year's harvest and preserved through the succeeding months in the manner described in previous reports i.e., by arranging the seed potatoes in shallow deal wood trays, deep and covering them with fine sand, was used for sowing in plot No. 34 and 40. Here again unfortunately it was not possible to provide necessary irrigations. We, however, managed to get some seed for this year's use and have preserved it for the next planting. About 20 lbs. of seed were also sent to Sangareddi where a fairly good yield was obtained. There also the small sized potatoes have been preserved for this year planting. Though it has not been possible to get definite results with regard to outturn, the very fact that it has been possible to preserve the seed from one year to another is very encouraging. With proper cultivation under controlled conditions the phulwa variety bids fair to prove as useful as it appears to be in upper India.

*Eucalyptus*.—The Eucalyptus tree. The variety citriodora is reputed to be useful in the prevention of malaria in the region it prevails in. With the object of making this plant easily available to the public we are making an effort at the instance of the Director of Agriculture to raise a large number of seedlings at our station here. This particular variety fortunately has taken very landly to the soil and climatic conditions obtaining here and several plants are growing in our section. In about four years many of them have attained a height of thirty feet and over. They are fairly drought resistant and need very little care once they are established. Our first attempt with seeds of this variety and also others (Robusta-Globulus) got from outside, was not very satisfactory. The percentage of germination of the variety Citriodora was very low and of the others nil. A second trial with seed of citriodora collected from our trees gave more encouraging results

as far as germination was concerned, but unfortunately owing to want of experience in the propagation of this plant a large number of seedlings were lost owing to their not having been transplanted in time. The fact appears to be that the seedlings do not transplant well. we are therefore arranging to transplant our next lot quite in an early stage and also trying to raise them directly in earthen pots.

*General Improvements.*—To provide more accommodation in the store-room an additional shelf was put up with angle iron and deal wood planking. The floor of all the three rooms of the store as well as the front verandah was done up with Shahabad stone slabs, and the verandah and the porch were roofed up with corrugated iron sheets.

*Roads.*—A road 8' wide was laid starting from the centre of the 8½' road between plot 39 and 40 and running all through the plots between 40 and 45. To facilitate easy access to all the plant in the various fruit plots foot paths 4' wide were laid across the central lines.

*Fencing.*—Arrangements for fencing up the hitherto open sides of the section of the west along the main road and the northern boundary have been partially made to a gate has been provided for the main entrance to the section.

*Drainage.*—To combat the water-logging conditions in all the plot lying on the north of plot 38 drains 5' wide at the top 3' at the bottom and 3' deep have been made along the following plots (see plan of section attached) 1. Plots 36 and 35. 2. Plots 34 and 33. These have been connected with the main drain along the northern boundary of the section (Plots 31 and 32) by means of a smaller cross drain. Arrangements are also in progress to make this drainage system more perfect by having another drain along the Eastern boundary of plots 35, 33 and 31 and finding an outlet for all the surplus water into the big P.W.D., drain at the extreme northern boundary of the Farm opposite the section.

*Museum.*—A Pomological museum is an essential adjunct of a horticultural station. A beginning has been made here to lay the foundation of what, with adequate help. It is hoped, will be quite a useful museum. Specimens of the different kinds and varieties of fruits

growing at the station and collected from outside have been collected and preserved in formalin (5 per cent.) for purposes of study and demonstration. Seed specimens of vegetables, flowers, trees, shrubs, have also been collected. A collection of mangoes of different varieties was made during the last season from Vicarabad, Hyderabad, Safdarnagar, Bidar, Koheer and coloured drawings in oil of selected types have been prepared to aid in the identification of classification of the varieties of this fruit. A regular record under the following heads has been kept for future work:—Name, source, length, breadth, thickness, weight, colour of flesh, colour of skin, shape, fibre, date of harvest. If the work in this line of study is continued it may be possible to understand the mango better and classify the varieties and to an extent at least remove the choos that at present prevails in the matter of mango nomenclature.

Besides the above every opportunity is availed of to collect the representative rocks and mineral of the different tracts and the soils. A beginning has also been made to collect the insects pest on our fruits and vegetables and preserve them for demonstration and instruction.

#### DISTINGUISHED VISITORS TO THE STATION.

Nawab Basalat Jah Bahadur honoured the station by visiting it twice.

Nawab Akeel Jung Bahadur also visited the station in the capacity of Sadrul Moham.

R. SULTAN,  
*Horticulturist.*

*Annual Report of the Garden at Rural Development Centre, (Patancharu) for the year 1342-43 F.*

The garden area at Patancheru attached to the Government Rural Development Centre is as far as technical advice is concerned continues to be under our charge and one of our trained students is working there as Darogha. The fruit area is quite in a thriving condition. The figs, plantains, peaches, rosberries have borne fruit. Of the subsidiary plantation the pine-apples have done quite well. The suckers were supplied from Himayatsagar station out of the lot that we had ordered from Kalimpong. The ornamental area has been improved by the planting of an avenue of Gold mohur and by addition of other ornamental plants supplied from the above station free and some of the changes in the general lay out were also made.

*Annual Report of the Sangareddi Gardens, for the year  
1342-43 F.*

The garden area attached to the Government Agricultural Farm at Sangareddi is under the immediate supervision of the Farm Superintendent who carries out the work as per directions of the Horticulturist.

Since there is very little chalka area at the Hamayat-sagar Horticultural Station therefore it has been proposed to make use of the light soil area of this garden which at present lying without any definite use for Date palm experimental and varietal test. The date overseer will shortly be put in charge of this work to start preliminary operations systematically till we receive plants from Iraq and Punjab.

After making an intensive survey of the area the garden was completely remodelled and a well considered planting scheme decided upon so as to make it serve as a district unit of the horticultural section of the department.

*Situation.*—The garden is situated on the Pothredipalli Road on the west of the Sangareddi town 14 miles from Shankerpalli station on H.E.H. the Nizam's Broad Guage Railways and adjoins the Agricultural Experimental Farm.

*Area.*—Total area is 23 acres. Nine acres are irrigable from 3 wells by lift. (Two of them are fitted up with oil-engines and pump and the third one is worked by country Mhote). The remaining acres are dry.

*Improvements.*—New roads and plots were laid out in field and much of the levelling work had to be done before the new plantation was started.

*Buildings.*—A green house is made with side wings to accommodate valuable fernery and palms during the

summer season. A verandah in front of the old building (the oil store room etc.) and 5 cisterns were constructed. These cisterns facilitate the watering of the plants and the ornamental and the nursery section of the garden.

*Water Supply.*—The garden is dependant for its water on three wells situated in plot 13, 1 and 18, and the haulage is done both by mhote and pumping plants.

*Soil.*—The prevailing soil is the typical red chalka well drained and eminently fitted for a variety of fruit crops.

*Fruit Crops in the Garden.*—(Plot 1). *Mosambi*—The plantation is of bearing age and we had a small crop during the year, most of it was sold at the Rudrur Demonstration. Plot 3 situated in front of the superintendent's quarters the whole area has been tastefully laid out with lawn and flower beds with a green house at the end. Plots 5, 7 and 9 have been taken up by a collection of mango varieties, and 10 and 11 have been reserved for the extension of the same plantation. Plot 12 will take dates and No. 15 reserved for its extension. Plot 13 is under miscellaneous fruits, 14 is taken up by sapotas, 16 by plantains, 17 by figs, 19 by pomegranates (newly started) and 21 reserved for custard apples. Vegetables which hitherto had formed the principle activity in this area is now restricted to plot 18.

*Vegetables.*—Different kinds of vegetables such as capsicum, knol khol, tomato, peas etc., were sown in different seasons for the local market in a area of about two acres.

*Expenditure.*—Total expenditure during the year under report was Rs. 2,257-13-6. The increase in expenditure was due to remodelling of the garden according to the re-organisation scheme. Out of the amount Rs. 500 sanctioned for the year 1343 F. for petty repairs Rs. 303 has been spent in the year 1342-43 F.

*Income.*—The income derived from the garden was Rs. 836-7-3.

*Staff.*—One senior and junior kamgar worked in the garden. During the year under report the senior kamgar Mr. Umraddin was transferred to Warangal as head gardener and in his place Mr. Musaheb Ali is working from 26th Amerdad 1342 F. The junior kamgar Mr. Tasadduq Husain was also transferred to Bidar under the Horticultural Assistant, Raichur and in his place Mr. Hyder Ali Mirza is working from 8th Isfandar 1343 F. The junior kamgar not only attends to the nursery of the garden but does propaganda work as well. Both the kamgars availed of privilege leave for one month 15 days and 26 days respectively.

R. SULTAN,  
*Horticulturist*

*Annual Report of the Horticultural Station at Warangal  
for the year 1342-43 F.*

Soon after the land in the year under report for the Main Farm of the Telengana Eastern Circle was acquired at Warangal. At the instance of the Director of Agriculture from this acquired land a suitable site for the Horticultural Station was selected in consultation with the Deputy Director of the Circle.

After the appointment of the Horticultural Assistant for this circle with the headquarters at Warangal, early in the month of Amerdad 1342 F., regular work as to layout and other preliminary operations was started immediately.

*Situation.*—The Horticultural Station is situated on the Hanamkonda Mulug Road 5 miles off from the headquarters of the District. The main farm roads form the boundaries of the station to the north and to east as well. To the south there is a waste water channel of the tank so called Kottacheru. With these boundaries all around, the station is situated at a prominent place on the main farm.

*Soil.*—The soil consists mostly of red loams and in some places there are patches of sand and alkaline land. Larger percentage of the sand with the subsoil of morum causes no fear of stagnation.

*Layout.*—The whole of garden area is divided into two sections tentatively. Section A consists of 14 rectangular plots each  $\frac{1}{2}$  an acre in area besides ornamental block. All the plots in this section are planted with important fruit trees of different varieties. The rest of the triangular area so called B section is almost full of ravines and undulated patches of the sandy soil. The levelled portion of this section is used for fruit, ornamental nursery and vegetable cultivation, while some of the plots which are being given shape and desirable size after filling in the ravines are used for miscellaneous fruit plantation of minor importance. Besides the main roads shallow drains 6" deep and 36" wide are made between the two plots to serve as drains and to be used as paths as well.

These drains in order to check erosion are filled with a course of rubble stones. With a strip of these stones the demarcation of each plot with different plantation has become quite clear. In following the general layout each of the plots has been levelled separately with the help of tractor, victory plough and scrapers. In course of levelling in order to avoid too much scraping a couple of terraces are also given in each  $\frac{1}{2}$  an acre block.

*Rainfall.*—The rainfall in the year under report was recorded 37 inches which is above normal. During the season the rain which was fortunately received intermittently facilitated the work of levelling and planting to a large extent.

*Irrigation.*—The source of irrigation on the farm is a well, which could not be constructed completely for some unavoidable reasons or other. Anyhow the water baled out from the well during construction was very economically used to maintain the planted area in A Section, but this could not satisfy the demand and caused a good percentage of the fruit plants suffer from want of proper irrigation during the hot months of the year. The lower portion of the garden area which is so called B section was managed somehow or other by lifting water from a small sink which was dug in there for drinking purposes, supplementary to this the irrigation channel from the tank for sometime was of much help to save the life of the green house plants and also of other important nursery stock.

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## FRUIT CROPS.

According to the nature of soil, suitability to climate and with due consideration to other factors governing the question of supply and demand a regular fruit plantation scheme for the Warangal Horticultural Station was prepared. After the approval of the Director of Agriculture it was brought into force early in the month of Isfandar 1343 F. by planting the following varieties of the fruit crops in their nominated plots:—

Plot No.	Sub-Plot	Area in acre	Name of fruit crop	Variety	Remarks
1	a	$\frac{1}{2}$	Pomegranate	Kabul Bedana	Planted on 16-4-43 F.
	b	$\frac{1}{2}$	Figs	Bangalore.	
2	..	$\frac{2}{3}$	Ornamental area.		
3	..	1	Citrus	Sour lime Karna Pomelo Orange Grape fruit Lemons Sweet lime	} 18-5.
4	a	$\frac{1}{2}$	Grapes	Bhokri Malta Black Bangalore	
	b	$\frac{1}{2}$	Custard apple	Local	19-4
5	a	$\frac{1}{2}$	Dates	..	Plants are being imported Planted on 6-5-43.
	b	$\frac{1}{2}$	Guavas	Allahabad Sufaida Hafsee	
6	a	$\frac{1}{2}$	Sapota	1 Large mammoth	h.
				2 All the year round.	
	b	$\frac{1}{2}$	Sub tropical fruits	Loquat Litchee Peaches Mangostene Apple.	
7	..	1	Mangoes	Plantation incomplete.	

The date plot will soon be planted after receiving the suckers from Basra. The scarcity of water in the year under report has caused a good number of plants of different varieties to be damaged. The filling in of gaps will be taken over after the desirable varieties are made available from the next year's budget. The surviving number of plants are all doing well.

*Spacing.*—While plotting two fruit crops which require equal spacing with due consideration to soil and the site are selected to be planted in plots which are opposite each other. This arrangement of equal spacing in both the opposite plots though of different crops gives a clear view when looked right through from the main roads.

*Plotting.*—The present design of plotting facilitates the visitors to pay attention to the different fruit crops on both the sides simultaneously when passing through the main road of the Horticultural station.

*Planting.*—The plantation of all the fruit crops on the station is according to the method known as *Quinquina*. This method of planting fruit trees increases the number of plants per acre as compared to the ordinary square method.

*Manuring.*—All the fruit plants are given general farmyard manure a pound of bone meal each.

*Miscellaneous Fruit Plantation.*—The area so called section B as referred under the heading layout is chiefly utilised for the crops of minor importance. In this block along the nala two varieties of cocoanut King and Dwarf are planted and the following plants could be grown on the levelled area which was so far made available after filling in the ravines:

- |                |                    |
|----------------|--------------------|
| 1. Raspberry   | 9. Jack fruit      |
| 2. Falsa       | 10. Awla           |
| 3. Pine-apples | 11. Ber (sowa)     |
| 4. Banana      | 12. Wood-apple     |
| 5. Figs        | 13. Rose-apple     |
| 6. Kamrac      | 14. Bullocks heart |
| 7. Bilimbi     | 15. Coffee         |
| 8. Harfa Levri | 16. Litchi         |

*Vegetables.*—The following vegetables are grown for the use of the farm colony and the surplus was disposed of in the market. Cabbage, knolkhol, brinjal, tomato, capsicum, beans, peas, bhendi, potato.

*Ornamental Area.*—Out of the ten acres of the garden area plot number 2 of about  $\frac{2}{3}$  of an acre is laid out as an ornamental block for demonstration and recreation purposes. An uptodate landscaping is designed with a lawn in the centre surrounding with shrubs, crotons, ferns, oleander, acalypha varieties and other decorative plants which gives a picturesque appearance. Paths are made between the lawn and the shrubberies with borders of alternanthera and justicia all around. To give the lawn a decorative effect aravcaria poinsettia, cypress, hibiscus, jacaranda, dracaena and such other plants are grown on it at a desirable distance. To add to the beauty of the design a series of arches from the entrance gate to the green house at each of the crossing of the garden roads are erected and they are covered each by different creepers as Bougainvillea honey suckle, Rangoon passion flower, juhee, antigonon and so many others which could be provided locally and a lot ordered from outside. A fountain is proposed to be constructed in the centre of the lawn, with garden benches to be placed at the suitable shady site to complete the requisites of a recreation garden.

*Fruit Nursery.*—During the year under report, the fruit nursery for distributing the plants to the intending growers in the Warangal District, has been started on an area of 10 guntas, at this Horticultural Station. Regular beds in 2 series are formed in plot No. 13 (a). The following plants are raised from seed suckers, for multiplication and to serve as stock for preparation by grafting and budding scion of desirable varieties.

1. Mango stones—2,000 (out of 5,000 collected).
2. Papaya (a) Washington, (b) Gujarat.
3. Guava (Nasik and Salem).
4. Sour lime.
5. Orange.
6. Phyllanthus Emblica (Awla).
7. Strawberry.
8. Basrai variety banana and other varieties.
9. Pomegranate.

The vegetable seeds sown in beds for multiplication are: (1) Tomato, (2) Brinjal, (3) Capsicum, (4) Bhendi, (5) Gowar (Gujarat).

*Avenue Plants.*—Avenue plants all along the wire fencing on the Mulug roadside are planted 20 ft. apart in double and alternate lines and grouped according to size and seasonal flowering. The following are the plants established.

- |                             |                             |
|-----------------------------|-----------------------------|
| 1. Bauhinia purpurea        | 2. Jacaranda mimosaeifolia  |
| 3. Tecoma stans.            | 4. Callophyllum Inophyllum. |
| 5. Eucalyptus globulus      | 6. Filicium Decipiens.      |
| 7. Petria volubilis         | 8. Cassia didymbotria.      |
| 9. Cassia floride siamea    | 10. Thespesia populnea.     |
| 11. Thevetia Nerifolia.     | 12. Nephelium longanum.     |
| 13. Grevellea Robusta.      | 14. Parkia Biglandv losa.   |
| 15. Swietenia Mahagoni.     | 16. Millingtonia Hortensis. |
| 17. Pithecolobium Saman.    | 18. Ficus Nilida.           |
| 19. Meha Azedaracta.        | 20. Poinciana Regia.        |
| 21. Ficus Religiosa.        | 22. Ficus glomerata.        |
| 23. Cupressus sempervirens. | 24. Feronia elephantum.     |

*Hedge and wind break.*—The following hedge plants are grown at the Horticultural Station, for purposes of education, demonstration as well as to supply variegated wind break plants to district gardeners.

(A) *North*—————*South*: all along wire fencing on the Mulug roadside:

1. Bhongir Hedge (addasaram—in Telugu).
2. Parkinsonia aculeata.
3. Erythrina Indica.
4. Divi-Divi.
5. Inga Dulcis (Madras Thorn).
6. Sesbania Egyptiaca.

*West*—————*East*. Main farm roadside: Northern border.

- |                              |          |        |
|------------------------------|----------|--------|
| 7. Murraya Exotica           | Plot No. | I A.   |
| 8. Dodonea                   |          | II A.  |
| 9. Duranta white             |          | III A. |
| 10. Hæmatoxylon Campechianum |          | IV A.  |
| 11. Duranta: blue            |          | V A.   |
| 12. Frenala Rhomboidea       |          | VI A.  |
| 13. Hakea Saligna            |          | VII A. |

*North*—————*South*. Eastern border:—

14. Custard-apple.
15. Wild pomegranate (flowering).
16. Cashew-nut.
17. Guava seedlings.
18. Bamboo.

*East*—————*West*. Nala side:—

19. Cassia Alata.
20. Moringa pterygosperma.
21. Sesbania grandi flora.
22. Balsamodendron Dalinii (Mangalore  
thorin).
23. Mulberry: morus alba: Morus Indica.
24. Eucalyptus citriodora.
25. Lawsonia Alba.

South of Fruit plantation—————Road:—

- |                             |          |        |
|-----------------------------|----------|--------|
| 26. Princepia uflis         | Plot No. | V B.   |
| 27. Halisfropium peruvianum |          | VI B.  |
| 28. Cupressus Maerocarpa    |          | VII B. |
| 21. Lantana (White flower)  |          | IV B.  |
| 30. Sesbania (Red-flowered) |          | III B. |

Besides these, the Horticultural Station has raised a Nursery of Eucalyptus citriodora and supplied to the Main farm about 250 plants for Avenue plantation on both sides of the farm roads.

*Equipments.*—The garden area always require enclosure of its own therefore pig proof fencing is made available with the necessary gates all round the Horticultural Station to make it quite safe. A commodious zinc shed of 40× 20 ft. dimension is erected which provides with two seperate rooms one is being used as store and the other for the Museum.

One of the essentials of the nursery is the green house, which is also, though on a very small scale but has been constructed during this year. This shady and cool place was of immense value during the hot months to protect the young seedlings from the scorching sun of the place.

M. R. SULTAN,  
*Horticulturist.*

*Annual Report of the Horticultural Station, Parbhani,  
for the year 1342-43 F.*

Out of the 300 acres of the Main Farm at Parbhani an area of about 10 acres was selected to start with for the Horticultural purposes. But now the Deputy Director of the Godavari Division proposes that the water supply from both of the existing wells of the Farm does not seem to be promising to maintain an area of 10 acres under fruit culture. Therefore in view of the fact the area of the Horticultural Station, which is at present was decided with the approval of the Director of Agriculture to reduce it to 4 acres only.

With this proposal of minimising the area some of the crops already established were effected, as for instance the newly started plantation of banana and papaya which are now growing satisfactorily are being handed over to the Farm. The other two crops guava and figs are still allowed to stand in their original places as they were pruned for shape and they have started their growth. A transfer at this time may lead to shock.

After minimising the area the work at the station chiefly consisted of remodelling and maintenance of the existing crop; cultivation of vegetables and raising of nursery stock.

### FRUIT CROPS.

*Pomegranates.*—Treated for Bahars and pruned for shape. The fruits are of small size and inferior type. In the present limited area of 4 acres there is no pomegranate crop therefore arrangements are being made to order few of the well known varieties. The existing plantation of the inferior varieties which has now gone beyond the limit of the Horticultural area is given in charge of the Farm Superintendent to make use of the plot for other irrigated crops of the Farm.

*Mosambi and Santra Orange.*—Trees are treated for Bahars with a view to get only a few fruits from each of the trees to determine their quality.

*Grape Fruit*.—Trees were treated for Bahar and a few of them are bearing fruits which are not yet ripened.

*Mangoes*.—Mango plants are planted about 4 years back but their condition is not promising. They could not be compared with the other plants of the similar age. Efforts are made to improve them.

*Miscellaneous*.—By the side of the well a well drained light soil land was lying without any use. This has been reclaimed, ravines filled and used for planting all kinds of miscellaneous fruit trees for demonstration purposes, and some of them to be used as stock for trial. The following are all growing up very satisfactorily.

1. Sapota.
2. Litchee.
3. Jack fruit.
4. Harfa levri.
5. Bilumbo.
6. Auwla.
7. Custard-apple.
8. Rose-apple.
9. Pine-apple.
10. Falsa.
11. Jambol.
12. Kaweet.
13. Seedling Mangoes.

*Ornamental Area*.—The ornamental work though on a very small scale but has to be continued in the office compound and in the courtyard of the officers' bungalows. The design of landscaping of the office premises changed and much of the remodelling work was carried on during the year under report. Besides this a small patch of lawn near the green house and at the crossing of the two main roads is designed surrounding with some of the ornamental plants. The main channel near the green house can conveniently irrigate this without any extra cost of irrigation. The growing of some of the annuals for seed along the water channels and on both the sides of the roads and paths is continued for collecting seeds and to serve as a charming border in their flowering season without any special arrangement of watering.

*Nursery*.—Seedling of guavas, papaya, eucalyptus were raised in the nursery and cuttings from the ornamental stock already existing on the station were taken and planted for distribution to the intending growers. Now a good number of them is ready for disposal.

The list of seeds of the fruit, vegetables and flowers is given below in detail to indicate the amount and variety produced on the station nursery.

#### STATION NURSERY.

			Lbs.
1. Papaya	Mixed	..	11
2. „	Gokad	..	$\frac{1}{4}$
3. „	Ceylon	..	$\frac{3}{4}$
4. „	Gujrat	..	$\frac{1}{4}$
			Ozs.
5. Guava	Mixed	..	3
6. „	Selected	..	1
			Seeds.
7. „	Seedless.	..	12

#### *Vegetable Seeds:—*

			Lbs.
1. Cluster beans	..	..	$3\frac{1}{2}$
2. Okra long green	..	..	$1\frac{1}{2}$
3. Okra	..	..	1
4. Soorti Fatdi	..	..	4
5. American beans	..	..	$\frac{3}{4}$
6. Cluster beans small	..	..	2
			Ozs.
7. Lima beans	..	..	$1\frac{1}{2}$
8. French beans	..	..	2
9. Padval	..	..	1
10. Brinjal	..	..	12
11. Tomato	..	..	12
12. Brinjal, black	..	..	4

*Flower Seeds:—*

			Ozs.
1. Cosmos ..	..	..	9
2. Cosmos, red ..	..	..	4
3. Giallardias ..	..	..	4
4. Zinnias ..	..	..	13
5. Arctotis ..	..	..	12
			Lbs.
6. Sunflower ..	..	..	35
7. Holly Hock ..	..	..	19
			Ozs.
8. Asters ..	..	..	4
9. Ipomea ..	..	..	3
10. Phlox ..	..	..	1½

*Miscellaneous:—*

			Lbs.
1. Sesbania ..	..	..	41
2. Ingadulcis ..	..	..	3½
3. Gold Mohar ..	..	..	8
4. Sunn-hemp ..	..	..	40
5. Parkinsonia ..	..	..	2

*Vegetables.*—A large variety of indigeneous and English vegetables were grown on the station with the express intention of supply to the Main Farm Colony. The surplus was sold out to the general public.

*General Improvements.*—The plots in the garden area on the Parbhani Main Farm were laid out on the field style, which had to be amended and in consequence most of the fruit plants were shifted with all necessary care to their proper place. All this was done during the year. Suitable drains were dug along the plots and roads for the surplus water to be drained off to save the crops which used to be affected during the rainy season.

A green house to protect the delicate nursery plants was erected and a zinc sheet shed of 15×30 ft. was constructed with a partition to make two different rooms and passage midway between to serve as a porch. Paths were opened along the length and breadth of the plots for an easy approach to each of the plantations.

The garden area was fenced with a pig proof fencing towards bullock shed to protect the plantation from stray attack of animals.

M. R. SULTAN,

*Horticulturist.*

*Annual Report of the Horticultural Station at Raichur,  
for the year 1342-43 F.*

*Introduction.*—After acquiring the land at Raichur for the Karnatic Main Farm in the year 1341 F. the Deputy Director of the circle selected about one-tenth of the total area for the Horticultural purposes. In the succeeding rainy season the garden was laid out and different kinds of fruit plants were planted by the Head gardener under the general supervision of the Main Farm Superintendent.

After the organisation of the Horticultural Section of the Department appointment of Horticultural Assistant was made for the Karnatic circle with the Head-quarter at Raichur, who took charge of the garden on 15th of Dai 1343 F.

*Situation.*—The garden area is situated almost in the centre of the Main Farm, just adjacent to the existing old temple. It is surrounded on all sides by the cultivable fields of the farm excepting the southern side, which is a site reserved for the Farm buildings to be constructed, since there is a general slope from north to south, therefore the flow of water was nuisance for the garden area. This defect was removed by putting a bund across to divert the course of the water and thus the garden area is safe now from being washed away.

*Object.*—(1) In following the general policy of the Department to establish a garden on each of the Main Farm. This Horticultural Station was started also as a place of demonstration and a source of inspiration to the cultivators of the circle. The demonstration in the art of gardening is not only a source of pleasure but also a lesson to aim for profit.

(2) This station along with the purposes of demonstration is meant to try those fruit trees which can be maintained under the climate of the place, and those which can resist drought when get acclimatized.

(3) Besides these objects a small nursery is started to supply seeds and plants to the intending

growers, and training is also given to produce practical growers. An area is also reserved for growing vegetables to supply to the Farm colony.

*Soil.*—The garden soil is not uniform. There are red chelka soils and medium alkaline soils. Chelka soils contain hard morum as its subsoil within the depth ranging from 1 to 2 feet, and they are well drained. Black soils are very deep and they are ill-drained. Alkaline soils get water logged during monsoons and hence create impossibility to grow any fruit crop.

*Area.*—Total area of the garden is 7 acres and 23 guntas excluding roads, buildings and waste land. According to the limited supply of water the actual cultivated area is 3 acres at present.

*Source of Irrigation.*—The irrigation source is very poor. There is only one well by the side of the store, which supplies water to the garden. This well has got a sheet of rock at its bottom. In summer hardly we get water by head-loads to save the plantation. The fruit area is equipped with pipe lines which carries water from the main tank near the moat, to the small cisterns placed here and there at convenient places in the fruit plantation.

*Fruit Crops.*—The following is the list of the fruit crop planted in the Horticultural Station at Raichur. The plantation is not only too young but also due to the present scarcity of water have not reached to any promising stage, so as to place any facts and figures on record about their growth.

[Statement,

*List of fruit trees in the Orchard at present Government Horticultural Station, Raichur.*

Serial No.	Name of plant fruit	Source	Number of plants	Area of the plot
1	Apple Cleopatra ..	Govt. Botanical Garden, Bangalore.	2	59 × 48'
	„ Delicious ..	„ „	2	
	„ Cox's Orange pippin ..	„ „	1	
2	Peach Indore, large	„ „	6	202' × 48' 8 guntas.
3	Mango Raspuri ..	„ „	6	
	„ Badami ..	„ „	5	
	„ Malgoa ..	„ „	2	
4	Bhear Nagpore ..	Vishno Sadasiv Poona ..	3	
5	Rose apple grafted	Moniarswami & Son, Bangalore.	6	118 × 70' = 8 guntas.
6	Guava Allahabad	„ „	19	118 × 60' = 6½ guntas.
7	Pomegranate, large	Vishno Sadasiv Poona ..	12	118' × 60' = guntas.
	„ Seedless	The fruit Nursery, Quetta.	8	
	„ Kandhar	„ „	3	
	„ Bloodred	„ „	4	
	„ Grafted	Mooniswamy & Son, Bangalore.	6	
8	Papaya Cylone extra choice	N. Cooper & Poona ..	22	118' × 60' = 6½ guntas.
9	Grape vine black	Govt. Botani. Garden Bangalore.	6	111' × 60' = 6 guntas.
	„ „ white	„ „	6	
	„ „ seedless, white	Fruit Nursery, Quetta ..	2	
	„ „ Muskati	„ „	1	
	„ „ Haiatha	„ „	2	
	„ „ Sahebi	„ „	5	
	„ „ Rose ..	„ „	2	
10	Fig Poona local	Vishno Sadasiv, Poona.	38	111' × 60' = 6 guntas.
	„ Maheshwaram	The Pioneer Horti. Inst. Hy'abd-Dn.	12	111' × 60' = 6 guntas.

*List of fruit trees in the Orchard at present Government Horticultural Station, Raichur.*

Serial No.	Name of the plant	Source	Number of plants	Area of the plot
11	Sapota extra large ..	Nawazish Bagh, Hyd...	14	111' × 70' = 7 guntas
12	Pomelo large sweet ..	Vishnoo Sadasiv, Poona	7	} 120' × 70' = 7½ guntas
13	Grape fruit Marsh's seedless ..	Mac. Isaac Estate, Bangalore.	4	
14	Orange Malta blood ..	" ..	2	
	" Velintia ..	" ..	8	
	" Washington Navel ..	" ..	1	} 120' × 60' = 6½ guntas
	" Kawla ..	Vishnoo Sadasiv, Poona	7	
	" Ladoo ..	" ..	7	
	" Nagpore ..	" ..	10	
15	Mozambique Kagzi ..	" ..	30	120' × 60' = 6½ guntas
16	Sour lime, local ..	Govt. Main Farm, Raichur.	3	} 120' × 6' = 6½ guntas
	" Kagzi seedless ..	Vishnoo Sadasiv, Poona	14	
	" Budded round ..	" ..	3	
17	Lemon Villa Franca ..	Mac. Isaac Estate, Bangalore.	1	}
	" Lisbon ..	" ..	1	
	" Eureka ..	" ..	1	
18	Plantain tall ..	Vishnoo Sadasiv, Poona	5	} 60' × 55' = 3 guntas
	" Yellow large fruited.	" ..	5	
	" " small fruited..	" ..	3	
	" Red Velchi ..	" ..	4	
	" Thin Rind ..	" ..	5	
	" Dwarf Green ..	" ..	2	
	" Mauritius ..	Mac. Isaac Estate, Bangalore.	3	
19	Cocoanut King ..	Vishnoo Sadasiv, Poona	6	} 210' × 55' = 10½ guntas
	" Green ..	" ..	4	
20	Pine-apple Queen..	Mac. Isaac Estate, Bangalore.	300	202' × 48' = 8 guntas

*Vegetables.*—A very small area for vegetables is set apart to grow indigeneous vegetables both in the Kharif and Rabi season. Most of the Kharif crop of vegetables is grown as a dry crop, but the English vegetables of the cold season are grown with irrigation. A detailed statement is given below to show the kinds of vegetables grown on the station and their yield in pounds.

Plot No.	Name	YIELD IN POUNDS PER MONTH								Total yield
		Azur	Dai	Bahm.	Isfandar	Tar.	Ardi.	Khur.	Tir	
1	Tomato	166½	105	331½	399	349½	62½	29	..	1,443
2	Bendi	20	16½	26	16	2½	2½	1½	..	95
3	Guava	5	..	..	..	..	..	..	..	5
4	Capsicum	4	7½	..	..	½	5	8	..	25½
5	Ridge gourd	6	41	18	1	..	..	..	..	66
6	Peas	..	..	½	..	1½	..	..	..	2½
7	Mint	..	..	3	..	½	15½	..	..	19½
8	Knolkhol	..	..	..	14½	8	..	..	..	22½
9	Radish	..	..	..	..	28	..	..	..	22½
10	Radish pods	..	..	..	..	..	2½	..	..	2½
11	Carrot	..	..	..	..	24	..	..	..	24
12	Beetroot	..	..	..	..	18	9	..	..	27
13	Onions	..	..	..	..	1	49	2	..	52
14	Brinjals	8½	29½	22½	23½	6	1	½	..	86½
15	Methi	..	..	..	..	2	29	..	..	41
16	Kulpha	..	..	..	..	..	46	..	..	46
17	Palak	..	..	..	..	..	4	..	..	4
18	Sweet potato	..	..	..	..	..	6	..	..	6
19	Coriander	..	..	..	..	..	22½	..	..	22½
20	Chamkara	..	..	..	..	..	3	..	..	3
21	Rajgira	..	..	..	..	..	6	..	..	6
22	Ambada	..	..	..	..	..	13	14	..	27

*General Improvements.*—There was much to do in the way of levelling, laying out of new paths and remodelling of some of the plots in the garden area. All this work was taken in hand soon after the appointment of the Horticultural Assistant was made at Raichur. Now as far as possible the garden area is made fit for systematic work.

The great drawback in the improvements of the fruit culture at Raichur, Horticultural station is the scarcity of water. Though there are two wells but out of them one is hopeless for the reason that it has got sheet rock at the bottom which cannot be removed to improve the water supply. The other old well which is almost reconstructed now is reserved for water supply of the Farm colony. To observe economy efforts are made to layout zinc pipe lines of 2" diameter and a tank is fixed at the Mhote to carry water without wastage to the plot where it is required. In absence of this arrangements there used to be a lot of expenditure in carrying head-loads of water during the hot season.

A new store shed is constructed in the year under report which consists of a couple of rooms, one for garden equipment and other for records.

M. R. SULTAN,  
*Horticulturist.*

*Programme of work of the Horticultural Section,  
for the year 1343-44 Faski.*

1. Study of the various varieties of mango, grapes, citrus, banana, fig, pine-apple, pomegranate, dates, custard-apple, guavas, cocoanut and papaya, with regard to their productiveness.
  2. Study of the various varieties of potatoes, guar, lady's-finger, tomato, brinjal, beans, beet, turnip and capsicum for their productiveness.
  3. Planting of new varieties of fruits and vegetables
-

*Annual Report of the Main Agricultural Experimental Farm, Himayatsagar, for the year 1342-43 F.*

*Introduction.*—After specially acquiring the lands for the purpose, the farm was started in 1336 F. The actual experimental work, however, could not be taken in hand before 1338 F.

*Situation.*—The farm is situated on the Hyderabad to Himayatsagar road at a distance of seven miles from Char Minar, nine miles from the Broad Gauge, and twelve miles from Metre Gauge Railway stations of Hyderabad-Deccan. Easi stream marks the northern boundary of the farm.

*Object.*—This farm is the main experimental farm intended for the study of the Agricultural Problems of the Telingana tract of H.E.H. the Nizam's Dominions.

*Soil.*—Most of the area of the farm is typical of Telingana tract consisting of high lying red chalka soils and low lying silted areas. The work of the blasting of boulders and rocks found in the areas has by no means finished as yet; though the majority of the fields have been made cultivable by blasting the boulders.

*Area.*—Total area of the farm consists of 298.5 acres, out of which 188.5 acres are under cultivation. Major portion of the remainder area with the exception of that under roads and buildings consists of uncultivable waste.

*Source of irrigation.*—The Irsalgandi channel carrying water from the Himayatsagar Reservoir to Mir Alum tank traverses its serpentine course through the farm area; and supplies water for irrigation. Attempt has been made to straighten the channel in some places where it had very sharp bends in order to stop seepage and water logging of the side lying fields.

There are 3 wells also situated inside the farm area, and are used for supplying water to the irrigated areas which cannot be commanded by the free flow from the channel.

Out of the total cultivated area of 188.5 acres, the irrigable area comprises of 91.5 acres, out of which 76.5 acres are irrigable by free flow and the remainder 15 acres by lift. It has been possible to add during the year under review an area of 17.5 acres to that irrigable by free flow by levelling the fields; and it is expected to add more in future years.

*Drainage.*—The raised abutments of Irsalgandi channel used to form a barrier in the free passage of rain water flooding from the southern hills with the result that a considerable portion of the farm lying on the southern side of the channel used to keep inundated for many days after a heavy shower of rain. Such undesired inundations had always been a drawback in effecting the proper cultivation and cropping of these areas. Arrangements for the excavation of a main drain and passing it through an aqueduct under the Irsalgandi channel were taken in hand towards the close of the previous year. The work was completed during the year under review and proved a great success.

*Season.*—Statement showing the incidence of rainfall during the year under review is attached. Total rain amounted to 32.50" which is 1.62" lower than that of the previous year, and approaches the average. The monsoons started in good time to prepare lands for sowing operations. In general the rains were well distributed excepting a spell of drought from 31st Shahrewar 1342 F. to 20th Mehir 1342 F. Some undesired heavy showers at the time of the fertilisation of jowar and bajra crops impaired the process rather badly and the grain setting was severely affected, but at the same time they were helpful in preparing lands and sowing of the Rabi crops.

*Experiments.*—The following experiments and field trials were carried out during the year under review.

EXPERIMENT NO. 1.—*Standard Manurial Experiment with paddy.*

*Object.*—To find out the manurial requirements of paddy soil and most profitable manure for the paddy crop.

*Plotting.*—The field was permanently laid out into standard sized plots in the year 1340-41 F. The plots are made 44'×11' measuring 1/90 acre each in area.

Strong boundary bunds 2' wide impervious to water are made all round the plots. Sixty-four plots are made in all, in 4 series of 16 plots, each containing 12 manured plots and 4 unmanured control plots.

*Preparatory tillage.*—One ploughing was done in dry field with victory plough on the 20th Khurdad 1342 F. (24th April 1933) and a second ploughing was done on the 8th Thir 1342 F. (13th May 1933). The puddling was then done with Meston plough nearly a fortnight later.

The plots were prepared for sowing by effecting a last ploughing with Meston plough and levelling with Jumbo on the 2nd Shehrewar 1342 F. (8th July 1933).

*Manures.*—The following manures were applied, at the rates mentioned in their respective plots.

1. Farmyard manure at 30 lbs. Nitrogen per acre.
2. Farmyard manure at 60 lbs. Nitrogen per acre.
3. Farmyard manure at 30 lbs. Nitrogen per acre plus Ammonium Sulphate at 30 lbs. Nitrogen per acre.
4. Farmyard manure at 30 lbs. Nitrogen per acre plus Superphosphate at 30 lbs. Phosphoric acid per acre.
5. Farmyard manure at 30 lbs. Nitrogen per acre plus Potassium Sulphate at 30 lbs. Potash per acre.
6. Farmyard manure at 30 lbs. Nitrogen per acre plus Ammonium Sulphate at 30 lbs. Nitrogen per acre plus Superphosphate at 30 lbs. Phosphoric acid per acre.
7. Farmyard manure at 30 lbs. Nitrogen per acre plus Ammonium Sulphate at 30 lbs. Nitrogen per acre plus Potassium Sulphate at 30 lbs. Potash per acre.
8. Farmyard manure at 30 lbs. Nitrogen per acre plus Superphosphate at 30 lbs. Phosphoric acid per acre plus Potassium Sulphate at 30 lbs. Potash per acre.
9. Farmyard manure at 30 lbs. Nitrogen per acre plus Ammonium Sulphate at 30 lbs. Nitrogen per acre plus Superphosphate at 30 lbs. Phosphoric acid per acre plus Potassium Sulphate at 30 lbs. Potash per acre.

10. Farmyard manure at 30 lbs. Nitrogen per acre plus Ammophos at 30 lbs. Nitrogen per acre.

11. Farmyard manure at 30 lbs. Nitrogen per acre plus Castor-cake at 30 lbs. Nitrogen per acre.

12. Farmyard manure at 30 lbs. Nitrogen per acre plus Bone-meal at 30 lbs. Phosphoric acid per acre.

In addition 4 non-manure plots are added to each series of 12 different applications.

Dates of applications of the various manures and fertilizers are shown below:—

Farmyard manure	..	2nd Amerdad 1342 F. ( 7th June 1933).
Bone-meal	..	2nd Amerdad 1342 F. ( 7th June 1933).
Castor-cake	..	26th Amerdad 1342 F. ( 1st July 1933).
Superphosphate	..	2nd Shahrewar 1342 F. ( 8th July 1933).
Potassium Sulphate	..	2nd Shahrewar 1342 F. ( 8th July 1933).
Ammophos	..	3rd Shahrewar 1342 F. ( 9th July 1933).
Ammonium Sulphate.—		
1st half	..	18th Shahrewar 1342 F. (24th July 1933).
2nd half	..	20th Mehir 1342 F. (26th August 1933).

*Sowing.*—Single seedlings of Nizamgoad variety of paddy were transplanted at a distance of 6"×4" on the 4th Shehrewar 1342 F. (10th July 1933).

*Weedings.*—One hand weeding was done on the 17th Mehir 1342 F. (23rd August 1933).

*Harvesting.*—All the plots were harvested on the 18th Dai 1342 F. (22nd November 1933).

*Yields.*—The average yields for the last five years are tabulated in the following statement.

## ABI SEASON.

Manurial treatment per acre	AVERAGE YIELDS OF PADDY IN lbs. PER ACRE									
	1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
No manure control ..	..	..	..	..	4,252	4,000	1,524	3,262	1,147	2,317
Farmyard manure at 30 lbs. Nitrogen ..	933	733	1,649	1,416	4,297	3,729	2,817	3,510	1,552	2,655
Farmyard manure at 60 lbs. Nitrogen ..	1,316	966	1,933	1,616	4,612	4,122	2,002	3,690	1,732	3,262
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate.	2,433	2,000	2,533	1,866	5,017	5,158	2,812	5,468	2,070	4,657
Farmyard manure at 30 lbs. Nitrogen + Superphosphate. ..	2,067	1,600	2,366	2,099	4,455	4,184	2,115	3,622	1,642	3,622
No manure control ..	..	..	..	..	4,455	4,078	1,597	3,105	1,102	2,340
Farmyard manure at 30 lbs. Nitrogen + Potas-ium Sulphate	2,100	1,500	2,599	2,949	4,657	4,815	2,003	3,712	1,237	4,545
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Superphosphate .	3,000	2,300	3,183	2,883	5,355	6,440	3,127	5,985	2,137	4,545
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Potassium Sulphat	2,716	2,133	2,533	2,183	5,580	6,052	2,947	5,670	1,935	4,455
Farmyard manure at 30 lbs. Nitrogen + Superphosphate + Potassium Sulphate .	2,400	1,700	3,099	4,033	4,882	4,781	2,137	4,477	1,575	2,880
No manure control ..	..	..	..	..	4,432	4,336	1,778	3,330	1,012	2,047
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Superphosphate + Potassium Sulphate .	2,333	2,033	3,199	2,049	5,242	5,388	2,992	6,120	2,182	4,680
Farmyard manure at 30 lbs. Nitrogen + Ammonophos ..	2,200	2,433	3,116	2,583	5,175	5,535	2,790	5,872	2,160	4,567
Farmyard manure at 30 lbs. Nitrogen + Castor cake ..	2,233	1,633	2,966	2,416	4,612	5,214	2,475	4,522	1,867	3,960
Farmyard manure at 30 lbs. Nitrogen + Bone-meal ..	1,333	933	1,733	1,433	4,657	6,308	1,733	3,915	1,192	2,407
No manure control ..	..	..	..	..	3,712	3,633	1,710	3,150	877	1,867

The same experiment was carried out with the same details and in the same plots in Tabi Season also.

Preparatory tillage operations were carried out from the 26th Bahmon 1343 F. (29th December 1933) to the 16th Farwardi 1343 F. (17th February 1934).

The manures were applied at the same rate as for Abi crop. The dates of application are given below:—

Farmyard manure	..	1st Isfindar 1343 F. ( 3rd January 1934).
Bone-meal	..	3rd Isfindar 1343 F. ( 5th January 1934).
Castor-cake	..	13th Isfindar 1343 F. (15th January 1934).
Superphosphate	..	16th Farwardi 1343 F. (17th February 1934).
Potassium Sulphate	..	16th Farwardi 1343 F. (17th February 1934).
Ammophos	..	17th Farwardi 1343 F. (18th February 1934).

Ammonium Sulphate.—

1st half	..	4th Ardibehisht 1343 F. ( 8th March 1934).
2nd half	..	5th Khurdad 1343 F. ( 9th April 1934).

Transplanting was done on the 17th Farwardi 1343 F. (18th February 1934) with single seedlings of Nizamgoad paddy in rows at a distance of 6"×4".

No weeding was given.

Harvesting was done on the 14th Thir 1343 F. (19th May 1934).

The yields are very low as the age of the seedlings at the time of transplanting had far advanced, for the well the only source of irrigation, was under repairs.

[Statement.

*Yields.*—The results of the yields of the last five years are tabulated in average figures per acre in the following statement.

## TABI SEASON.

Manurial treatment per acre	AVERAGE YIELDS OF PADDY IN lbs. PER ACRE									
	1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
No manure control ..	..	..	..	..	1,000	1,125	981	923	112	1,305
Farmyard manure at 30 lbs. Nitrogen ..	750	1,033	849	1,199	1,215	1,147	1,198	990	157	1,575
Farmyard manure at 60 lbs. Nitrogen ..	1,616	1,416	916	849	1,406	1,575	1,328	1,350	270	1,778
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate ..	1,399	1,616	1,133	983	1,991	2,115	1,565	1,507	124	2,002
Farmyard manure at 80 lbs. Nitrogen + Superphosphate ..	1,400	1,933	1,366	1,049	1,474	1,402	1,422	1,282	247	1,530
No manure control ..	..	..	..	..	855	1,226	789	810	45	652
Farmyard manure at 30 lbs. Nitrogen + Potassium Sulphate ..	1,800	1,767	933	1,116	1,271	1,125	1,135	1,080	405	2,250
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Superphosphate ..	2,066	2,083	1,783	1,599	2,565	2,587	1,880	1,935	371	3,240
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Potassium Sulphate ..	1,850	1,966	1,799	1,449	2,059	2,182	1,512	1,642	214	3,105
Farmyard manure at 30 lbs. Nitrogen + Superphosphate + Potassium Sulphate ..	1,616	1,816	1,466	1,383	1,485	1,462	1,351	1,350	461	2,992
No manure control ..	..	..	..	..	878	1,192	962	900	146	1,912
Farmyard manure at 30 lbs. Nitrogen + Ammonium Sulphate + Superphosphate + Potassium Sulphate ..	1,866	1,950	1,466	1,200	2,488	2,981	1,911	1,620	742	3,822
Farmyard manure at 30 lbs. Nitrogen + Amphos ..	2,366	1,850	1,383	1,216	2,205	2,452	2,336	2,340	1,069	4,455
Farmyard manure at 30 lbs. Nitrogen + Castor-cake ..	2,000	1,800	1,449	1,266	1,980	2,284	1,962	1,867	664	4,095
Farmyard manure at 30 lbs. Nitrogen + Bone-meal ..	1,350	1,916	816	733	1,159	1,328	1,236	1,237	405	2,547
No manure control ..	..	..	..	..	832	1,136	987	945	382	2,497

## EXPERIMENT NO. 2.—*Paddy Rotation Experiment.*

*Object.*—To investigate the possibilities of replacing Tabi rice with any other more profitable Rabi crops.

*Plotting.*—Twenty plots measuring 9/250 acres each in area. All plots are sown with paddy in Abi. In Tabi each plot is sown with any other Rabi crop reserving two plots for Tabi paddy in each series of 10 plots.

*Preparatory tillage.*—The dry field was ploughed with the Victory plough thrice between the 3rd Khurdad and 19th Amerdad 1342 F. (17th April and 24th June 1933). Puddling was commenced from the 25th Amerdad 1342 F. (30th June 1933) and was finished on the 31st Amerdad 1342 F. (6th July 1933).

*Manuring.*—Compost at the rate of 30 lbs. Nitrogen per acre was applied to all the plots on the 29th Amerdad 1342 F., (4th July 1933) and a top dressing of Ammophos was given before transplanting.

*Sowings.*—Single seedlings of Nizamgoad variety were transplanted 6"×4" apart on the 2nd Shahrewar 1342 F. (8th July 1933).

*Weedings and interculture.*—One hand weeding was given on the 14th Mehir 1342 F. (20th August 1933).

In the Tabi season the following crops, namely, paddy, onions, garlic, potatoes, chillies, tobacco, ground-nuts, wheat, and gram were sown in the particular plots fixed for them in rotation.

Preparation of seed bed was much delayed owing to the stagnation of water in the field, which was rather difficult to drain off. Consequently the sowings had to be done very late which naturally affected adversely on the growth of the crop outturns.

The following statement shows the results of the yields.

## ABI PADDY.

Serial No.	Name of crop	AVERAGE YIELDS PER ACRE IN lbs.									
		1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1	Paddy	.. 3,222	2,680	3,111	3,417	3,083	3,985	2,983	4,097	2,222	2,166
2	"	.. 3,569	2,486	2,680	1,930	2,860	3,249	2,827	3,793	2,486	3,458
3	"	.. 4,028	2,861	2,777	2,833	3,346	3,680	3,201	5,180	2,750	3,180
4	"	.. 4,202	3,472	3,250	2,194	3,249	4,041	3,269	4,917	2,972	4,023
5	"	.. 4,222	3,361	2,969	2,147	3,291	4,588	3,242	4,694	3,139	3,582
6	"	.. 4,222	3,722	2,805	2,489	3,430	4,486	3,339	5,527	2,902	2,874
7	"	.. 3,819	3,000	2,763	2,833	3,291	4,083	3,097	4,500	2,805	2,694
8	"	.. 3,375	2,694	2,486	2,153	3,235	3,749	2,910	4,847	2,861	3,249
9	"	.. 3,625	2,722	2,611	2,264	3,082	3,999	2,653	3,514	2,263	2,361
10	"	.. 2,639	2,291	2,453	2,097	2,958	4,633	3,026	3,222	2,180	2,333

## TABI CROPS.

1	Paddy	.. 1,375	1,500	1,500	1,183	2,513	1,972	1,069	944	805	1,333
2	Onions	.. 5,305	..	5,930	..	5,666	..	6,958	..	6,028	..
3	Garlic	.. 791	..	1,667	..	246	..	550	..	417	..
4	Potatoes	.. 3,194	..	2,903	..	409	..	..	..	188	..
5	Chillies	.. 5	..	69	..	60	..	..	..	..	..
6	Tobacco	.. 555	..	..	..	139	..	..	..	..	..
7	Ground-nuts	.. 1,139	..	1,861	..	513	..	708	..	..	..
8	Wheat	.. 395	486	361	403	97	236	105	244	..	..
9	Gram	.. 472	222	472	264	385	319	485	277	896	701
10	Paddy	.. 1,139	1,250	1,125	1,148	1,736	1,916	1,055	971	625	1,458

*Note.*—Chillies, tobacco, ground-nuts and wheat were total failure. Similarly the outturn of garlic was very low and the corns produced were not well developed and therefore did not find any market.

Rates of sale of the various crops during the five seasons were as follows:—

Serial No.	Name of crop	RATE OF SALE PER MAUND OF 80 lbs.				
		1938-1939 F.	1939-1940 F.	1940-1941 F.	1941-1942 F.	1942-1943 F.
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1	Paddy ..	3 5 0	2 8 0	2 0 0	1 8 0	1 8 0
2	Onions ..	1 5 0	1 8 0	1 5 0	1 2 0	1 4 0
3	Garlic ..	8 0 0	11 0 0	10 0 0	5 0 0	..
4	Potatoes ..	5 0 0	3 5 0	4 3 0	3 8 0	4 0 0
5	Chillies ..	10 0 0	13 5 0	11 7 0	10 0 0	..
6	Tobacco ..	5 0 0	4 3 0	6 10 0	8 0 0	..
7	Ground-nuts ..	5 0 0	4 5 0	5 0 0	5 0 0	..
8	Wheat ..	6 0 0	5 5 0	5 0 0	5 0 0	..
9	Gram ..	3 5 0	3 10 0	3 13 0	3 5 0	3 0 0

In accordance with the rates given in the above statement, the product per acre in the shape of money is calculated as follows:—

Serial No.	Name of crop	MONEY VALUE OF THE CROP PER ACRE				
		1938-1939 F.	1939-1940 F.	1940-1941 F.	1941-1942 F.	1942-1943 F.
1	Paddy ..	6/12+15/	46/14+11/14	62/13+19/12	20/1+9/7	15/-+13/5/4
2	Onions ..	86/3	111/3	92/1	97/13	60/4/4
3	Garlic ..	79/1	239/10	30/12	34/6	No crop.
4	Potatoes ..	199/10	119/12	21/7	No crop	8/1/4
5	Chillies ..	-/10	11/7	8/12	No crop.	No crop.
6	Tobacco ..	34/11	No crop.	11/7	No crop.	No crop.
7	Ground-nuts ..	71/3	100/-	32/1	50/6	No crop.
8	Wheat ..	27/10+4/14	23/14+4/-	6/1+2/6	7/2+3/-	No crop.
9	Gram ..	19/7+2/4	21/4+2/10	17/5+3/3	22/-+3/-	33/9/7+7/-
10	Paddy ..	47/-+12/8	33/14+11/8	43/6+19/3	17/3+8/13.	11/10+14/9

*Note.*—The straw of paddy, and bhussa of wheat and gram have been calculated at Re. 1 per 100 lbs.

It will be observed from the above statement that the crops of chillies, tobacco, wheat and gram are not likely to replace paddy profitably.

The rotation effects of these crops on Abi paddy are another matter for consideration.

EXPERIMENT NO. 3.—*Manurial Experiment with paddy to find out the optimum Nitrogen Phosphoric acid ratio.*

The following ratios were tried:—

- (1) Ratio 1:  $\frac{1}{2}$  i.e. 30 lbs. Nitrogen per acre+  
15 lbs. Phosphoric acid per acre.
- (2) Ratio 1:1 i.e. 30 lbs. Nitrogen per acre+  
30 lbs. Phosphoric acid per acre.
- (3) Ratio 1:1 $\frac{1}{2}$  i.e. 30 lbs. Nitrogen per acre+  
45 lbs. Phosphoric acid per acre.
- (4) Ratio 1:2 i.e. 30 lbs. Nitrogen per acre+  
60 lbs. Phosphoric acid per acre.

Fertilizers used for the supply of the desired quantities of Nitrogen and Phosphoric acid consisted of Nicifos, Diammophos and Ammonium Sulphate.

*Plotting.*—361 plots measuring 9'×8' each (1/605 acre) are prepared in 19 series on Latin square method, each series consists of 19 plots. Suitable bunds, channels and drains are prepared round each plot to separate it from the adjoining plots. Buffer plots, between, separated the treated and control plots.

*Preparatory cultivation.*—The size of the plots is so small that all operations have to be done by hand labour. Digging of dry land with pick-axe was done from the 23rd to 26th Ardibehisht 1342 F. (27th to 30th April 1933).

First puddling was done from the 26th to 28th Amerdad 1342 F. (1st to 3rd July 1933). Second, and the final puddlings were completed on the 6th Shahrewar 1342 F. (12th July 1933).

*Manuring.*—The buffer and control plots were not given any manure at all. The other plots were given the prescribed quantities for each respectively. The fertilizers had been analysed beforehand, and the quantities necessary to make up the desired ratios were carefully

weighed out at the time of application in accordance with their analysis results. The fertilizers were distributed in their respective plots as evenly as possible.

Diammophos was applied on the 5th Shahrewar 1342 F. (11th July 1933). Nicifos, and Ammonium Sulphate were applied in two equal dressings. The first dressing was done on the 22nd Shahrewar 1342 F. (28th July 1933) and the second on the 24th Mehri 1342 F. (30th August 1933).

*Sowings.*—Single seedlings of Nizamgoad paddy were transplanted 6"×4" apart on the 7th Shahrewar 1342 F. (13th July 1933).

*Weedings and interculture.*—Only one hand weeding was done on the 20th Mehri 1342 F. (26th August 1933).

*Harvesting.*—The crop was reaped on the 20th Dai 1343 F. (24th November 1933).

*Yields.*—The statement showing the yields of the control and manured plots follows.—The yields of the buffer plots are not included in the statement.



The experiment was repeated in Tabi season in the same plots with similar details of treatments. The transplanting of seedlings, however, was delayed for a few days owing to well, which is the only source of water, being under repairs. The growth of the crop was rather indifferent, and no harvest could be collected at the end.

EXPERIMENT NO. 4.—*Manurial Experiment with oil-cakes.*

*Object.*—To find out the relative value of the cakes as manure for Kharif jowar.

*Soil.*—Light chalka.

*Preparatory tillage.*—Two ploughings with the Victory plough were given on the 4th Thir 1342 F. (9th May 1933) and 3rd Amerdad 1342 F. (8th June 1933). Another ploughing followed by working the cultivator and running of patha was done on the 16th Amerdad 1342 F. (21st June 1933). Disc harrow was worked on the field on the following day.

*Plotting.*—Twenty plots measuring  $55' \times 24' = 1/33$  acre each in area were prepared to allow of 4 replications. The plots were separated from one another by leaving good sized strips of land between.

The experiment was transferred on a new field during the year under review, because the field previously reserved for the experiment got inundated in the preceding year during the rains, and remained under stagnant water for a considerable period.

*Manuring.*—The cakes were applied in their respective plots in a thoroughly powdered form on the 18th Amerdad 1342 F. (28th June 1933) at the rate of 30 lbs. nitrogen per acre. The cakes were well mixed in the soil by working a cultivator after it.

Castor-cake, safflower-cake and ground-nut cake were used. Cotton-seed-cake was not available, and therefore the plots reserved for that had to go without manure. In addition 4 untreated control plots were also kept.

*Sowing.*—Local yellow jowar was sown in rows  $1\frac{1}{2}'$  apart behind the cultivator on the 21st Amerdad 1342 F. (26th June 1933). Thinning of the plants to one foot apart in the rows was done about 3 weeks after sowing.

*Germination and growth.*—Germination was good but the growth was poor and very uneven owing to the unevenness of fertility in the field.

*Weedings and interculture.*—Three hand weedings were done owing to the plots growing lot of weeds.

*Rainfall and irrigation.*—No irrigation was given. The rainfall during the growing period of the crop amounted to 23.53".

*Pests and diseases.*—Nothing noteworthy.

*Harvesting.*—All plots were harvested on the 2nd Dai 1344 F. (6th November 1933).

*Yields.*—The following statement shows the yields calculated in lbs. per acre.

S. No.	Treatment	OUTTURN IN LBS. PER ACRE									
		Series A		Series B		Series C		Series D		Average	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1	Castor-cake ..	116	1,419	347	3,696	536	3,960	248	3,300	312	3,094
2	Safflower cake ..	264	3,234	380	2,343	627	5,181	264	2,475	384	3,308
3	Ground-nuts cake	380	2,640	561	5,115	248	5,610	380	3,861	392	4,307
4	No manure ..	231	3,300	198	3,100	380	4,620	132	2,310	235	3,332
5	No manure control ..	363	2,805	50	2,145	347	4,983	33	1,089	198	2,755

NOTE—The crop was poor and uneven, No results can therefore be drawn.

#### EXPERIMENT No. 5.—*Manurial Experiment with farm-yard manure and compost.*

*Object.*—To find out the relative value of farmyard manure and compost as manure for Kharif jowar.

*Soil.*—Light chalka.

*Preparatory tillage.*—Two ploughings were given on the 4th Ardibehisht and 2nd Amerdad 1342 F. (8th March, and 7th June 1933), respectively. Cultivator was worked on the 11th Amerdad 1342 F. (16th June 1933).

*Plotting.*—Twelve plots measuring  $55' \times 44' = 1/18$  of an acre each in area were prepared in an acre field leaving strips of land between the plots for separating them. Four replications of the treated and untreated control plots were arranged.

*Manuring.*—Farmyard manure, and compost were applied in their respective plots at 30 lbs. Nitrogen per acre on the 15th Amerdad 1342 F. (20th June 1933) and well mixed in the soil by working a cultivator.

*Sowings.*—Local yellow jowar was sown by dropping sulphur treated seed behind the cultivator in rows  $1\frac{1}{2}'$  apart on the 16th Amerdad 1342 F. (21st June 1933). The thinning of the plants to proper distances and filling of gaps were done three weeks after sowing.

*Germination and growth.*—The germination was good, but the growth was very uneven and poor owing to the after effects of scraping the soil for levelling.

*Weedings and interculture.*—Three weedings were done owing to the field having been overrun with weeds.

*Rainfall and Irrigation.*—No irrigation was given. The rainfall during the period of the growth of the crop amounted to 23.53".

*Pests and diseases.*—Nothing noteworthy.

*Harvesting.*—The crop in all the plots was harvested on the 24th Azur 1343 F. (29th October 1933).

*Outturn and yields.*—The following statement shows the yields calculated in lbs. per acre.

S. No.	Treatment	OUTTURN IN lbs. PER ACRE									
		Series A.		Series B.		Series C.		Series D.		Average	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1	Farmyard manure ..	432	828	648	3,132	900	4,428	144	360	531	2,118
2	Compost ..	36	324	905	3,456	792	5,400	226	1,116	489	2,571
3	Control No manure. ..	34	612	738	2,592	864	4,716	23	612	415	2,118

NOTE.—The crop was poor and uneven. No results can therefore be drawn.

EXPERIMENT NO. 6.—*Comparison of Kharif jowar varieties.*

*Object.*—Eleven varieties of Kharif jowar were grown to find out the most profitable variety suitable for the Telingana tract.

*Soil.*—Light chalka.

*Preparatory tillage.*—One deep ploughing with Victory plough was done on the 21st Azur 1342 F. (26th October 1932). A second ploughing was done on the 1st Dai 1342 F. (5th November 1932). Disc harrow and cultivator were run on the field in summer to keep it in good tilth. Finally cultivator and patha were run over the field on the 6th Amerdad 1342 F. (11th June 1933) and the land was prepared for sowing.

*Plotting.*—Forty-four plots measuring  $1/32$  acre each in area were prepared to allow of 4 replications.

*Manuring.*—A quantity of 16,000 lbs. of compost was applied per acre and well mixed in the soil by working the cultivator on the 19th Thir 1342 F. (24th May 1933).

*Sowing.*—Sowing was accomplished by dropping the seeds behind the cultivator in rows  $1\frac{1}{2}$ ' apart on the 8th Amerdad 1342 F. (13th June 1933). Seed rate was about 11 lbs. per acre.

Gap filling was done a fortnight after sowing.

The thinning of plants to about one foot apart was done on the 7th Shehrewar 1342 F. (13th July 1933).

*Germination and growth.*—The germination was good but the growth was uneven due to the effects of the scraping of land for levelling.

*Weedings and interculture.*—Two weedings and one interculture with cultivator and two hoeings with Norcross were done.

*Rainfall and irrigation.*—No irrigation was given. Rainfall during the growing period of the crop amounted to 27.73" for California Dwarf, Pocha Junna, Cawnpore Dodania, and Local varieties. All the other varieties received 29.07".

*Pests and diseases.*—Slight attack of borer in early stages.

*Harvesting.*—The varieties were harvested in the order of their ripening. Californian dwarf was the earliest to mature and was reaped on the 18th Azur 1343 F. (23rd October 1933). Pocha junna, Cawnpore Dodania, and Local were the next to mature, and were harvested on the 10th Dai 1343 F. (14th November 1933). All others were harvested on the 23rd Dai 1343 F. (27th November 1933).

*Yields.*—The following statement shows the average yields calculated in lbs. per acre.

S. No.	Name of variety	AVERAGE YIELDS IN lbs. PER ACRE									
		1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1	Aishpuri .. ..	..	..	..	..	..	..	45	5,148	49	4,400
2	Californian Dwarf ..	621	1,167	518	4,500	55	2,002	220	3,721	190	2,456
3	Cawnpore Dodania ..	959	2,315	1,223	16,619	149	2,260	165	3,674	324	3,256
4	Gadgiri ..	1,092	4,213	4	6,953	447	5,847	50	6,930	29	6,022
5	Ilaspuri ..	889	3,546	5	7,360	239	6,248	77	5,049	29	4,832
6	Kodaldani .. ..	..	..	..	..	..	..	265	6,193	114	4,216
7	Local, white .	44	3,648	14	2,933	19	6,128	1	8,437	151	3,143
8	Local, yellow ..	1,074	1,796	360	9,027	445	4,020	462	2,321	217	4,123
9	Pocha junna ..	666	1,685	386	4,173	352	7,689	76	6,413	370	4,655
10	Ramkhel .. ..	..	..	..	..	..	..	264	4,510	72	6,576
11	Saoner ..	564	4,491	16	9,447	239	9,421	35	6,523	114	4,216

NOTE.—Gidgap variety was discarded for being very late in maturity and producing very little of grain. It was therefore not included in the experiments during the year under review.

EXPERIMENT NO. 7.—*Comparison of Bajra varieties.*

*Object.*—Seven varieties of Bajra were grown to find out the most profitable variety suitable for the Telingana tract.

*Soil.*—Light chalka.

*Preparatory tillage.*—One deep ploughing with Victory plough was given on the 4th Thir 1342 F. (9th May 1933) followed by a cross ploughing on the 4th Amerdad 1342 F. (9th June 1933). Cultivator was worked a number of times to keep the tilth in fine condition.

*Plotting.*—Twenty-eight plots measuring  $1/20$  acre each in area were prepared to allow of 4 replications of the varieties.

*Manuring.*—Nil.

*Sowing.*—The seeds of the different varieties were sown in their respective plots by dropping the seeds behind the cultivator in rows  $1\frac{1}{2}$ ' apart on the 13th Shahrewar 1342 F. (19th July 1933). Seed rate employed amounted to about 7 lbs. per acre.

Gap filling was done on the 31st Shahrewar 1342 F. (6th August 1933).

Thinning of the plants was done on the 21st Mehir 1342 F. (27th August 1933).

*Weeding and interculture.*—One hand weeding, one hoeing with Norcross, and one interculture with cultivator were done.

*Rainfall and irrigation.*—No irrigation was given. Total rainfall during the growing period of Behar and Cawnpore awned varieties amounted to 17.60" while all other varieties received 18.95".

*Pests and diseases.*—No pest was noticed.

*Harvesting.*—Behar variety was the earliest to mature, and was harvested on the 3rd Dai 1343 F. (7th November 1933). Cawnpore awned was the next to ripen, and was reaped on 12th Dai 1343 F. (16th November 1933). All other varieties were harvested on the 22nd Dai 1343 F. (26th November 1933).

*Yields.*—The following statement shows the average yields in lbs. calculated per acre.

S. No.	Name of variety	AVERAGE YIELDS IN LBS. PER ACRE									
		1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1	Akola .. ..	..	..	681	1,199	175	825	278	785	269	1,495
2	Akola 14 B. .. ..	..	..	..	..	..	..	608	2,086	326	2,005
3	Akola 32 C. .. ..	..	..	..	..	..	..	387	2,084	300	1,305
4	Behar .. ..	..	..	..	..	..	..	438	772	240	1,185
5	Cawnpore awned	682	1,402	876	1,408	173	940	897	1,155	381	1,810
6	Kambo .. ..	..	..	..	..	..	..	320	1,669	281	1,505
7	Local .. ..	601	1,866	828	1,273	190	614	481	1,348	314	1,185

NOTE.—None of the varieties yielded well during the year under review.

#### EXPERIMENT NO. 8.—*Comparison of ground-nut varieties.*

*Object.*—Six varieties of ground-nuts were grown to find out the most profitable variety suitable for Telingana tract.

*Soil.*—Light chalka.

*Preparatory tillage.*—After removal of the previous crop two ploughings with Victory plough were given on the 20th Azur and 1st Dai 1342 F. (25th October, and 5th November 1932) respectively. Disc harrow and cultivator used to be run on the field whenever necessary afterwards, until the preparation of seed bed by working the cultivator and patha on the 4th Thir 1342 F. (9th May 1933), and 9th Amerdad 1342 F. (14th June 1933).

*Plotting.*—Twenty-four plots measuring  $55' \times 48' = 2/33$  of an acre each in area were prepared to allow of 4 replications of the varieties.

*Manuring.*—No manure was applied.

*Sowing.*—The seeds of the various varieties were dibbled in their respective plots 9" apart in rows 12" apart on the 5th Amerdad 1342 F. (27th June 1933).

*Germination and growth.*—Germination was good and the growth fair. The varieties (more especially small sized nuts) suffered on account of the dry spell of weather in Mehir 1342 F.

*Weedings and interculture.*—Two hoeings with Norcross and one hand weeding were done in all.

*Rainfall and irrigation.*—No irrigation was given. Rainfall during the period the crop was in the field amounted to 28.41".

*Pests and diseases.*—Crows were a general pest in all stages of growth.

*Harvesting.*—All varieties were harvested between the 24th and 27th Azur 1343 F. (29th October and 1st November 1933). The small nut varieties had ripened earlier but harvesting could not be arranged at that time.

*Yields.*—The following statement shows the average yields of the varieties in lbs. per acre.

Serial No.	Name of variety	AVERAGE YIELDS IN LBS. PER ACRE				
		1338-1339 F.	1339-1340 F.	1340-1341 F.	1341-1342 F.	1342-1343 F.
1	Hebbal No. 1 ..	..	771	2,089	2,128	1,394
2	Kanki No. 17 ..	776	1,627	2,076	2,137	1,423
3	Madagaskar ..	..	..	..	1,266	1,740
4	Small Japan ..	..	..	..	1,885	837
5	Spanish Pea-nut No. 5 ..	666	1,089	1,553	1,832	1,072
6	Spanish Pea-nut No. 9 ..	..	..	..	1,671	899

#### EXPERIMENT NO. 9.—*Comparison of Arhar varieties.*

*Object.*—Eleven varieties of arhar were grown to find out the most profitable variety suitable for the Telingana tract.

*Soil.*—Light chalka.

*Preparatory tillage.*—After removal of the previous crop, two deep ploughings with Victory plough were given on the 19th Azur and 1st Dai 1342 F. (24th October, and 5th November 1932). Disc harrow was run on the field on the 7th Dai 1342 F. (11th November 1932).

Seed bed was prepared on the 2nd Amerdad 1342 F. (7th June 1933) by working a country bakhar followed by patha.

*Plotting.*—Forty-four plots measuring  $1/32$  acre each in the area were prepared to allow four replications of each variety.

*Manuring.*—No manure was given.

*Sowings.*—Seeds were dibbled 18" apart in rows 3' apart on the 10th Amerdad 1342 F. (15th June 1933). Gap filling in two series was done on the 22nd Amerdad 1342 F. (27th June 1933) while complete resowing was done in the other two series on the same date because of the original germination being very poor. The gap filling in resown plots was done on the 1st Shahrewar 1342 F. (7th July 1933).

*Germination and growth.*—After the gap filling the germination was good in 3 series and growth normal; while the plots of the 4th series were located in a depression which got more or less water logged, and the growth was very poor in that series. So far so that it was totally excluded from the results.

*Weedings and interculture.*—Three hand weedings and 4 intercultures with cultivator were given.

*Rainfall and irrigation.*—No irrigation was given. Rainfall during the growing period of Unao early amounted to 27.39", for Pusa E, Coimbatore red, and Poona red amounted to 28.74" while all the other varieties received 30.32" of rainfall.

*Pests and diseases.*—Nothing noteworthy.

*Harvesting.*—The varieties were harvested as they matured. Unao Early was the earliest to ripen and was harvested on the 18th Azur 1343 F. (23rd October 1933). Pusa E, Coimbatore red, and Poona red were the next to ripen, and were harvested on the 10th Bahmon 1343 F. (13th December 1933). All the other varieties were harvested on the 8th Ardibehisht 1343 F. (12th March 1934).

*Yields.*—The following statement shows the average yields calculated in lbs. per acre:—

Serial No.	Name of variety	AVERAGE YIELDS IN LBS. PER ACRE			
		1939-1940 F.	1940-1941 F.	1941-1942 F.	1942-1943 F.
1	Cawnpore Local ..	1,099	487	983	1,632
2	Coimbatore Red ..	..	..	573	1,140
3	Local ..	1,38	348	696	1,850
4	Nagpur No. 3 ..	..	..	256	1,058
5	Nizam Tur ..	..	..	947	997
6	Poona Red ..	..	..	907	1,638
7	Pusa A. 2 ..	..	789	622	1,229
8	Pusa E. ..	..	..	475	1,188
9	Pusa T. G. ..	..	691	334	877
10	Pusa 80 ..	..	..	..	1,013
11	Unao Early ..	..	23	247	358

NOTE.—Unao Early is the earliest to ripen but the yield is very low. It is therefore proposed to discard this variety from the future tests.

#### EXPERIMENT No. 10.—*Comparison of sugar-cane varieties.*

*Object.*—Eleven varieties of sugar-cane were grown to select the most profitable variety.

*Soil.*—Silted area, medium regur.

*Preparatory tillage.*—The preparation of land for sugar-cane sowing was started after ploughing in a crop of sunn-hemp grown in the field for the purpose of green manuring.

The field was levelled in the previous Rabi season. Sunn-hemp was sown on the 27th Amerdad 1343 F. (2nd July 1933). The crop grew well, and was buried in the ground by working Victory plough over it on the 14th Mehir 1341 F. (20th August 1932). The green manured sunn-hemp was allowed to rot in the field. Trenches were dug on the 25th Bahmon 1342 F. (28th December 1932). Victory plough was worked in the

trenches on the 2nd Isfandar 1342 F. (4th January 1933) and hand digging in the trenches done on the 5th Isfandar 1342 F. (7th January 1933). The trenches were two feet wide and 9" deep. The distance between the trenches from centre to centre amounted to 4'.

*Plotting.*—The field was divided into 32 plots of 1/20 acre each in area to allow of 4 replications of the 4 Coimbatore varieties and P.O.J. 2878 and two replications of the other six thick varieties.

*Manuring.*—Castor-cake at 100 lbs. Nitrogen per acre was applied on the 15th Isfandar 1342 F. (17th January 1933) and well mixed with the soil in trenches by hoeing with pick-axes.

*Sowing.*—Planting of cane sets in the trenches was done on the 24th Isfandar 1342 F. (26th January 1933). Sets with 3 eye-buds were planted end to end in shallow furrows dug in the bottom of the trenches, and covered with earth. The eye-buds were kept sideways.

Gap filling was done on the 10th Ardibehisht 1342 F. (14th March 1933).

*Irrigation and rainfall.*—First irrigation was given immediately after planting. Subsequent irrigations were done at intervals varying from a fortnight to a month according to crop requirements. In all 9 irrigations were applied before the crops reached the stage of maturity. The rainfall during the period of the growth of the crop amounted to 37.20".

*Weeding and interculture.*—Every irrigation was followed by an interculture from the time of sowing to the beginning of Amerdad 1342 F. (June 1933) when the plants grew rather tall for the operation. The trenches were filled and the plots levelled on the 21st Amerdad 1342 F. (26th June 1933). Earthing of the sugar-cane rows was done in the end of Shahrewar 1342 F. (1st week of August 1933). A second earthing was found necessary in the case of D. 109, H.M. 544, and H.M. 320 because of their tendency to lodge. This second earthing was done only in the plots of the varieties mentioned in the month of Aban 1342 F. (September 1933).

Following started towards the end of Azur 1343 F. (October 1933), and by the end of Dai 1343 F. (November 1933), all the other varieties had flowered with the exception of Fiji B which did not flower at all.

*Harvesting.*—The harvesting and the crushing of the varieties was done between the 26th Bahmon and 29th Isfandar 1343 F. (29th December 1933 and 31st January 1934). The produce was manufactured into gur.

*Yields.*—The following statement shows the average yields of gur in lbs. per acre:—

Serial No.	Name of variety	AVERAGE YIELD OF GUR IN LBS. PER ACRE				
		1338-1339 F.	1339-1340 F.	1340-7341 F.	1340-1342 F.	1342-1343 F.
1	Co. 213 ..	9,600	8,955	9,840	8,505	12,780
2	Co. 223 ..	10,140	5,985	7,705	8,115	11,675
3	Co. 281 ..	6,600	7,545	5,955	8,422	11,180
4	Co. 290 ..	7,200	8,400	12,980	12,390	13,715
5	D. 109 ..	..	..	..	..	14,580
6	Fiji B. ..	..	..	..	..	13,850
7	H. M. 320 ..	..	..	..	8,475	15,160
8	H. M. 544 ..	..	..	..	..	12,200
9	H. M. 544 striped .	..	..	..	..	12,840
10	P. O. J. 2714 ..	..	..	..	7,087	14,560
11	P. O. J. 2878 ..	..	..	..	..	15,955

D. 109 has a tendency to lodge, Fiji B is a very thick and short variety. H.M. 320, and H.C. 544 shoot up early and cannot stand long for the harvest. All these four varieties were discarded in the sowings for the following year and E.K. 28 included.

Sowings of the sugar-cane varietal tests for the following season were completed on the 25th and 26th Isfandar 1343 F. (27th and 28th January 1934).

Some 23 new varieties of sugar-cane were got and sown in propagation lines during the year under review. The five varieties received in the previous year are also

growing in propagation lines, and the area under them has been increased in ratio of the availability of the seed.

EXPERIMENT NO. 11.—*Comparison of wheat varieties.*

*Object.*—Twelve varieties of wheat were grown to find out the most profitable variety for the Telangana tract.

*Soil.*—Silted area, medium regur.

*Preparatory tillage.*—Country bakhar was worked on the field twice on the 16th Khurdad and 17th Tir 1342 F. (20th April and 22nd May 1933) respectively. One deep ploughing with Victory plough was given on the 20th Amerdad 1342 F. (25th June 1933). The field was harrowed afterwards on the 14th Mehri 1342 F. (20th August 1933).

*Plotting.*—Forty-eight plots of  $1/72$  acre each in area were prepared to allow of 4 replications of the varieties.

*Manuring.*—Castor-cake at 30 lbs. Nitrogen per acre was applied on the 19th Dai 1343 F. (23rd September 1933) and was well mixed with a cultivator.

*Sowing.*—Seeds were sown with the help of the cole's drill in lines 9" apart on the 12th Azar 1343 F. (17th October 1933). Gap filling was done on the 26th Azar 1343 F. (31st October 1933).

Both the germination and growth were good.

*Weeding and hoeings.*—One hoeing with Norcross was done on the 24th Azar 1343 F. (29th October 1933) and also a hand weeding was done on the 25th Dai 1343 F. (29th November 1933).

*Irrigation and rainfall.*—No irrigation was given. The rainfall received by the crop amounted to 8.45".

*Pests and diseases.*—All varieties got attacked by rust.

*Harvesting.*—The Pusa varieties and Cawnpore No. 13 were the earliest to ripen and were harvested on the 20th Farwardi 1343 F. (21st February 1934).

The other varieties were harvested 3 days later.

*Yields.*—The following statement shows the average yields in lbs. per acre.—

S. No.	Name of variety	AVERAGE YIELD IN lbs. PER ACRE										
		1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.		
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	
1	A. O. 13	..	..	..	..	..	..	..	..	784	2,537	
2	A. O. 85	..	..	..	..	..	....	1,362	3,086	774	2,340	
3	A. O. 88	..	..	..	..	..	..	..	..	850	2,088	
4	A. O. 90	..	..	..	..	..	..	1,338	3,531	1,134	1,800	
5	A. O. 115	..	..	..	..	..	..	1,322	3,471	922	2,664	
6	Bansi	..	733	522	705	1,307	848	2,912	1,630	2,463	945	2,376
7	Cawnpore No.13	..	932	539	807	1,472	786	1,856	1,396	3,416	1,134	1,800
8	Pusa 4	..	528	443	739	1,125	282	1,262	1,110	2,063	958	2,016
9	Pusa 80/5	..	..	..	..	..	..	908	2,657	875	2,106	
10	Pusa 111	..	..	..	..	..	..	1,189	2,112	683	1,584	
11	Sharbati	..	841	392	846	1,642	757	2,178	1,202	3,168	693	2,374
12	Shetparner	..	..	..	..	..	..	1,208	2,310	306	2,216	

#### EXPERIMENT NO. 12.—*Comparison of gram varieties.*

*Object.*—Eight varieties of gram were grown to find out the most profitable variety for cultivation in the Telingana tract.

*Soil.*—Silted area, medium regur.

*Preparatory tillage.*—Country bakhar was worked on the field twice on the 16th Khurdad and 17th Thir 1342 F. (20th April and 22nd May 1933) respectively. Two deep ploughings with Victory plough were given on the 21st Amerdad and 9th Mehri 1342 F. (26th June and 15th August 1933), respectively. Cultivator was occasionally worked afterwards to keep the field open.

*Plotting.*—Thirty-two plots measuring  $1/44$  acre each in area were prepared to allow of 4 replications.

*Manuring.*—No manure applied.

*Sowing.*—Seeds were sown with the help of cole's drill in lines 9" apart on the 11th Azur 1343 F. (16th October 1933).

The germination and the growth were good.

*Irrigation and rainfall.*—No irrigation was given. The rainfall received by the crop amounted to 8.45".

*Weedings and interculture.*—Two hoeings with Norcross were done on the 24th Azur and 6th Bahmon 1343 F. (29th October and 9th December 1933) respectively.

*Pests and diseases.*—The Bengal-gram was attacked by wilt.

*Harvesting.*—All varieties were harvested on the 27th Farwardi 1343 F. (28th February 1934).

*Yields.*—The following statement shows the average yields in lbs. per acre:—

S. No.	Name of variety	AVERAGE YIELD IN lbs. PER ACRE											
		1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.			
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw		
1	Bengal	..	..	..	..	..	..	1,221	1,056	567	452		
2	Cawnpore	..	284	449	744	807	957	1,166	1,342	1,551	940	858	
3	Local	..	125	216	802	929	715	660	1,353	1,144	962	803	
4	Poona	..	..	..	..	..	..	1,353	1,056	982	792		
5	Pusa 17	..	..	..	..	..	..	822	1,353	671	638		
6	Pusa 25	..	330	559	694	1,055	874	308	1,243	1,430	951	792	
7	Pusa 28	..	..	..	..	..	..	763	1,386	555	638		
8	Sabour No. 4	..	62	386	757	951	759	748	1,287	1,411	1,017	1,034	

#### EXPERIMENT NO. 13.—*Comparison of Rabi jowar varieties.*

*Object.*—Five varieties of Rabi jowar were sown to find out the most profitable variety for cultivation in the Telingana tract.

*Soil.*—Silted area, light regur.

*Preparatory tillage.*—Country bakhar was worked twice in summer 1342 F. (1933). A deep ploughing and a harrowing were done in the rainy season.

*Plotting.*—Sixteen plots measuring  $1/22$  acre each in area were prepared to allow of 4 replications.

*Sowings.*—Seed was sown with the help of cole's drill in rows 18" apart on the 13th Azar 1343 F. (18th October 1933). The germination was good. Gap filling was done on the 27th Azar 1343 F. (1st November 1933). Thinning was done on the 14th Dai 1343 F. (18th November 1933) and the plants were left from 6" to 9" apart.

*Weedings and interculture.*—Three hoeings with Norcross were done in all.

*Irrigation and rainfall.*—No irrigation was given. Total rainfall received by the crop amounted to 5.01".

*Diseases and pests.*—The crop was rather badly attacked by stem-borer, more especially the Californian Dwarf.

Due to the deficiency of moisture in the soil at the time of lowering, no seed formation took place.

*Harvesting.*—Only kadbi was collected on the 19th Ardibehisht 1343 F. (23rd March 1934). Thus the experiment has been a failure so far as the results are concerned.

EXPERIMENT NO. 14.—*Planting time tests with irrigated ground-nuts in Rabi season.*

*Object.*—To study the behaviour of ground-nuts as an irrigated crop in Rabi season and to find out the best time for planting in order to secure maximum yields.

*Soil.*—Red chalka.

*Preparatory tillage.*—Country bakhar was worked in each individual plot before sowing.

*Manuring.*—The plot was scraped for levelling in the previous season; and therefore an application of 6,000 lbs. of prickly-pear compost was applied on the 13th Tir 1342 F. (18th May 1933). Sunn hemp was grown on the plot during the monsoons and has buried with the help of an inverting plough to serve as a green manure.

*Plotting.*—Twenty-four plots measuring 1.75 acre each in area were made to allow of six sowings for each of the 4 varieties.

*Sowings.*—The seeds of each variety were hand dibbled in 4 lines every month starting from the 12th Azur 1343 F. (17th October 1933).

*Varieties.*—Two big sized nut varieties namely Kanki No. 17, and Hebbal No. 1, and two small sized nut varieties namely, Spanish pea-nut No. 5, and Spanish pea-nut No. 9, were selected for sowings.

*Germination and growth.*—Germination was good in all varieties and in all sowings. Growth, however, was patchy in some lines.

*Weedings and interculture.*—Practically every irrigation was followed by a weeding.

*Irrigations.*—Six to nine irrigations were necessary in plot according to their dates of sowing.

*Pests and diseases.*—Nothing noteworthy.

*Harvesting and yields.*—The digging of nuts was carried out as soon as the crop matured. The period of growth and maturity decreased as the season of sowing advanced with the exception of last sowing, the crop of which extended into the following monsoons. The first sowings took about 21 weeks for maturity and the last 16 weeks. The small sized nut varieties took 3 weeks lesser in each case.

The following statement shows the yield per acre:—

Date of sowing	YIELD IN LBS. PER ACRE			
	Kanki No. 17	Hebbal No. 1	Spanish pea-nut No. 5	Spanish pea-nut No. 9
12th Azur 1343 F. ..	1,050	1,087	1,312	357
14th Dai 1343 F. ..	788	825	825	788
15th Bahmon 1343 F.	1,237	1,164	957	900
16th Isfandar 1343 F.	975	1,500	1,182	1,368
17th Farwardy 1343 F.	825	975	862	1,275
14th Ardebehisht 1343	1,275	975	1,200	1,275

**NON-EXPERIMENTAL CROPS.**—*The following statement shows the areas and actual outturns of the general crops grown on the farm during the year under review.*—

Serial No.	Name of crop	Area		ACTUAL OUTTURN IN lbs.			Remarks
		Acres	Gunthas	Grain	Fodder		
					Green	Dry	
1	Arhar .. ..	15	..	4,765	..	6,083	Seed cotton.
2	Berseem.. ..	1	..	73	2,759	..	
3	Castor .. ..	2	..	668	..	..	
4	Cotton .. ..	4	20	476	..	..	
5	Gram .. ..	43	20	21,386	..	6,083	Dry pods
6	Ground-nuts ..	3	..	3,594	..	..	
7	Jowar .. ..	..	..	..	..	..	
	Seed.. ..	1	30	291	..	2,192	
	Fodder .. ..	39	32	..	45,849	163,023	
8	Lucerne .. ..	One	..	..	17,232	..	
9	Maize .. ..	..	..	..	..	..	
	Fodder .. ..	11	..	..	87,057	..	
10	Mung .. ..	..	13	55	..	..	
11	Niger seed ..	..	13	90	..	..	
12	Oats .. ..	1	14	..	12,904	..	
13	Paddy Abi ..	7	..	5,898	..	7,282	
	„ Tabi .. ..	7	..	2,743	..	1,412	
14	Seasamum ..	..	13	107	..	..	
15	Sugar-cane ..	..	13	..	22,004	..	Stripped cane.
16	Tobacco .. ..	..	20	3	..	741	Dry leaf.
17	Udid .. ..	..	13	110	..	..	

An area of 7 acres was placed at the disposal of the Economic Botanist for plant breeding and selection work. Out of this 4 acres were used for paddy, 2 acres for castor, and one acre for wheat, Rabi castor and other miscellaneous Abi crops.

Cotton Research Botanist took an acre and a quarter of land for cotton breeding and selection work.

All labour, implements, etc., required by the above mentioned experts for carrying out their work were supplied by farm.

*Permanent improvements.*

*Levelling and lay-out.*—Levelling of fields was continued in full zeal. About 9 acres of land have been completely levelled; and another 5 acres were in hand at the close of the year.

Modifications in the previous lay-out of the farm have been effected in order to make economic use of the areas. The whole of the farm has been marked out to be laid in blocks. The block boundaries are being marked as the time and opportunity comes to hand.

The chalka fields have been bounded with stone bunds.

In accordance with the modification scheme of the lay-out of the farm, the  $8\frac{1}{2}'$  paths running east-west have been reduced to  $5\frac{1}{2}'$  to serve as bunds and drains to facilitate the drainage of individual plots. The surplus of  $2\frac{3}{4}'$  of land from each of these footpaths has been utilised in opening out 3 new roads of about 30' width each to facilitate the easy access to the far lying portions of the farm.

The dividing line running from north to south between the two plots has been widened and made into a six feet space to facilitate the turning of bullocks and demarcation of the plot boundary bunds. This space of six feet has been taken from both sides of the main 45' roads.

*Roads.*—In order to facilitate excess to the various parts of the farms, cross road have been marked out and constructed. The cross road on the southern side of the poultry-yard has been completed.

A new road in the northern areas of the farm has been made by levelling the bund of the main drain, and the old tank bund on the side of river area. Both these bunds were waste and now by turning them into roads, these have been made useful.

The position of the central road has been marked out. Also the position of road on the northern side of the laboratories.

The cross road from the garden road to office has been constructed.

Three causeways to cross the new drain have been constructed.

Construction of 2 new culverts and repairs of the old one on Irsalgandi channel is in progress.

Seven new gates have been erected in the farm boundary during the year under review.

*Wells.*—A new engine-shed has been erected on the Tamarind well.

The construction of four walls of the Neem well was taken in hand and a good deal of work was accomplished.

Silt clearance of the Banyan well was done and a stone wall on the eastern side to serve as the foundation of an engine and pump has been constructed. This well will be used as a water reservoir and will be recouped by free flow from the Irsalgandi channel.

*Buildings.*—Three residential quarters, *i.e.*, for the Agricultural Chemist, Assistant Chemist, and the Entomological Assistant have been constructed on the farm and handed over by the P.W.D.

The construction of laboratories is being pushed through.

One Kamgar's quarter, and two menials' quarters for the staff of the Chemist have been constructed and handed over by the P.W.D.

*Implements and machinery.*—All the implements and machinery including two oil-engines and one tractor were thoroughly overhauled during the year; and put in working order. Various spares were purchased according to necessity. The following new implements were purchased during the year under review:—

1. Drag scrapers	..	..	..	20
2. Plant pullers	..	..	..	6
3. Corn planters	..	..	..	2
4. Cole's seed drill	..	..	..	1
5. Hand chaff-cutter	..	..	..	1

Some old implements were transferred to the farm from the Agricultural Directorate.

The following implements were received from Messrs. Cooper Engineering Works, Satara, for trial and comment:—

1. Nahan type cane crushing mill	..	1
2. Guntaka .. .. .	..	1
3. Double mould board plough (furrower).		1
4. Ridge maker .. .. .	..	1
5. Cooper's light ploughs .. .. .	..	2

One complete set of power chaff-cutter was transferred to the farm from the Agricultural Officer, Mahbubnagar.

*Live-stock.*—Two bullocks died during the year. The remainder 50 heads of cattle kept in good health and did good work for the farm.

*Manure pits.*—Thirty compost pits were kept in constant use throughout the year. 353 cart-loads of compost and 150 cart-loads of ordinary farmyard manure were manufactured. (cart-load=800 lbs.)

*Finances.*—The farm expenditure during the year under report amounted to Rs. 39,599-14-3 and the income Rs. 4,540-12-4.

*Charge and establishment.*—Mr. Mohomed Ishaq, remained in charge as Farm Superintendent throughout the year, and was ably assisted by Mr. Mohomed Aquil Khan, the Assistant Farm Superintendent.

The two probationer Agricultural Officers, Mr. Abdur Rahim Mian, and Mr. Mohomed Ali Khan were transferred on the 8th Bahmon 1343 F., the former to Rudroor and the latter to Sangareddy. Mr. Ahsan Hussain was attached to the farm on the 18th Tir 1343 F.

Mr. Syed Mohomed Jafer Razvi was appointed as probationer Agricultural Officer and reported on the farm on the 14th Farwardi 1343 F.

A. SOOFEE,

*Deputy Director of Agriculture,  
Western Telingana Division,  
Himayatsagar,  
Hyderabad-Deccan.*

*Statement showing the record of rainfall at the Main Agricultural Experimental Farm, Himayatsagar, for the year 1342-43 Fasi.*

## RAINFALL IN INCHES

Date	Amer- dad	Shah- rewar	Meher	Aban	Azur	Dai	Bah- mon	Isfan- dar	Far- wardi	Ardi behist	Khur- dad	Thir
1	..	0.25	..	..	..	..	..	..	..	..	..	..
2	..	0.25	..	..	0.20	..	..	..	..	..	..	..
3	0.67	0.97	..	1.62	0.10	..	..	..	..	..	..	..
4	..	..	0.10	0.48	..	..	..	..	..	..	..	..
5	0.19	0.11	..	0.54	..	..	..	..	..	..	..	..
6	0.08	0.28	..	0.84	..	..	..	..	..	..	..	..
7	0.42	..	..	..	..	..	..	..	..	..	..	0.11
8	..	..	..	0.48	..	..	..	..	..	..	..	..
9	0.33	..	..	..	..	..	..	..	..	..	..	..
10	1.02	0.33	..	..	..	..	..	..	..	..	..	..
11	..	0.06	..	..	..	..	..	..	..	..	..	..
12	1.84	..	..	..	0.19	..	..	..	..	..	..	..
13	1.00	..	..	..	8.21	..	..	..	..	..	..	..
14	..	..	..	..	2.08	0.90	..	..	..	..	0.14	..
15	..	..	..	..	..	0.45	..	..	..	..	0.24	..
16	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..
20	..	0.20	..	..	..	..	0.60	..	..	..	..	..
21	..	0.24	0.10	..	..	..	0.98	..	..	..	..	..
22	0.33	0.30	1.20	..	..	..	..	..	..	..	..	..
23	0.41	0.15	0.28	..	..	..	..	..	..	..	..	..
24	1.07	1.33	0.10	..	..	..	..	..	..	..	..	..
25	1.87	0.62	0.16	..	..	..	..	..	..	..	..	..
26	..	1.38	..	..	..	..	..	..	..	..	..	..
27	..	0.29	0.36	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	0.32	0.82	..	..	..	..	..	..	..	..	..
30	..	0.17	0.34	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..
<b>Total.</b>	<b>9.23</b>	<b>7.25</b>	<b>3.41</b>	<b>3.41</b>	<b>5.78</b>	<b>1.35</b>	<b>1.58</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>0.38</b>	<b>0.11</b>

Grand total for the whole year is 32.50".

*Main Agricultural Experimental Farm, Himayatsagar.*

The Programme of Research and Experimental Work to be carried for the year 1343-44 F., is as follows:—

1. Standard manurial experiment with paddy.
2. Paddy rotation experiment.
3. Manurial experiment with paddy to find out the optimum Nitrogen Phosphoric acid ratio.
4. Manurial experiment with oil-cakes.
5. Manurial experiments with farmyard manure and compost.
6. Comparison of Kharif jowar varieties.
7. Comparison of bajra varieties.
8. Comparison of ground-nut varieties.
9. Comparison of arhar varieties.
10. Comparison of sugar-cane varieties.
11. Comparison of wheat varieties.
12. Comparison of gram varieties.
13. Comparison of Rabi jowar varieties.
14. Planting time tests with irrigated ground-nuts in Rabi season.

*Annual Report of the Agricultural Experimental Farm, Sangareddy, for the year 1342-1343 F.*

*Introduction.*—Until the year 1327 F. (1918) the present farm area used to be under the charge of the Veterinary Department, and was used as grazing grounds for the stud horses. The Stud Farm having been removed to Hingoli, this area was handed over to the Agricultural Department. A lot of spade-work had to be done in order to render the fields capable of being used for experimental work. The wet area of the farm has been perfectly levelled and is getting established while the dry area is being scraped to fill the depressions and the levelling of the fields is being continued as the time and opportunity occurs.

Proper Agricultural Experimental work was started on the farm in the year 1339 F. (1929) and the year under report is the fifth year of experimental work.

*Situation.*—The farm is situated on the Potareddipalli road, on the west of Sangareddy town, at a distance of 14 miles from Shankarpalli station on H.E.H. the Nizam's Broad Gauge Railways.

*Object.*—This farm is maintained for carrying out the Experimental work for the Telingana chalka soils, to supplement the work being carried out on the Main Agricultural Experimental Farm at Himayatsagar.

*Soil.*—The major portion of the farm land consists of high lying, well drained, red chalka soils, representative of the Telingana tract.

*Area.*—Total area of the farm consists of 78 acres as follows:—

Area	IRRIGATED ACRES		Unirrigated acres	Total acres
	Free flow	Lift		
Farm .. ..	9½	3½	52	65
Pasture .. ..	..	..	11	11
Homestead ..	..	..	2	2
Total .. ..	9½	3½	65	78

*Source of Irrigation.*—The main irrigation channel from Malkapur tank passes through the farm lands and supplies water for irrigation. Water-supply is generally ample in Abi, but in Tabi season sometimes scarcity of water is noticeable. During the year under review, the Irrigation Department allowed water for 5 acres only in Tabi season.

There are 3 pucca wells also situated in the farm area but these are only very seldom used, as it is cheaper and easier to lift water from the channel than the wells in ordinary seasons.

*Season.*—The total rainfall during the year under review amounted to 51.52" which is a good deal higher than the figures for the previous seasons. The distribution, however, was rather uneven, and therefore the crops did not attain ideal growth.

There was nothing extraordinary about the seasonal temperatures in summer and winter.

*Experiments.*—The following pages will show the details of the crop experiments conducted during the year and the results obtained.

#### EXPERIMENT NO. 1.—*Manurial Experiment with Nicifos on Paddy.*

*Object.*—To find out if Nicifos is more profitable a fertiliser for Paddy than a combination of Ammonium Sulphate and Superphosphate.

*Soil.*—Paddy soil.

*Treatment.*—The following different treatments were given.

- (a) Farmyard Manure alone at 20 lbs. Nitrogen per acre.
- (b) Farmyard Manure at 20 lbs. Nitrogen per acre plus Nicifos ( $18/22$ ) grade at 20 lbs. Nitrogen per acre.
- (c) Farmyard Manure at 20 lbs. Nitrogen per acre plus Ammonium Sulphate at 20 lbs. Nitrogen per acre plus Superphosphate at 20 lbs. Phosphoric acid per acre.

*Plotting.*—Permanent plot measuring  $66' \times 22' = \frac{1}{30}$  acre each in area separated from each other by buffer plots measuring  $66' \times 6' = \frac{1}{110}$  acre each in area are made, and employed for the experiment every season.

## ABI CULTIVATION.

*Preparatory tillage.*—Three ploughings with Meston plough were given on the 10th, 14th and 29th Amerdad 1342 F. (15th, 19th, June and 4th July 1933) respectively. Jumbo was worked on the 3rd Shahrewar 1342 F. (9th July 1933).

*Manuring.*—The manures were supplied to their respective plots on the dates given below:—

Farmyard Manure (Full quantity) 16th Amerdad 1342 F. (21st June 1933).

Superphosphate (full quantity) 3rd Shahrewar 1342 F. (9th July 1933).

Nicifos (full quantity) 10th Shahrewar 1342 F. (16th July 1933).

Ammonium Sulphate (first half) 28th Shahrewar 1342 F. (3rd August 1933).

Ammonium Sulphate (2nd half) 27th Mehir 1342 F. (2nd September 1933).

*Transplanting.*—Single seedlings of Texinal paddy about a month old were transplanted at a distance of about 6"×4" in all the plots on the 10th Shahrewar 1342 F. (16th July 1933).

*Irrigation.*—The plots were irrigated every alternate day until about 10 days before harvest when the watering was stopped to let the plots get dry.

*Growth.*—The crop in all plots grew well. The crop in plots treated with Nicifos showed a marked improvement over the crop in other plots in height and tillering.

*Weeding.*—One weeding was done on the 23rd Mehir 1342 F. (29th August 1933).

*Pests and Diseases.*—Slight attack of Hispa was observed.

*Harvesting.*—The reaping of crops in all plots was accomplished on the 25th Azur 1343 F. (30th October 1933).

## TABI CULTIVATION.

*Preparatory tillage.*—One ploughing with a turn-wrest plough on the 2nd Dai 1343 F. (6th November 1933). Subsequently 3 ploughings with Meston plough each followed by the working of Jumbo were done on 17th Bahman, 28th Bahman, and 2nd Isfandar 1343 F. (20th December, 28th December 1933 and 4th January 1934) respectively.

*Manuring.*—The manures were applied to their respective plots on the dates given below:—

Farmyard Manure (full quantity) 6th Bahman 1343 F. (9th December 1933).

Superphosphate (full quantity) 2nd Isfandar 1343 F. (4th January 1934).

Nicifos (full quantity) 9th Isfandar 1343 F. (11th January 1934).

Ammonium Sulphate (1st half) 24th Isfandar 1343 F. (26th January 1934).

Ammonium Sulphate (2nd half) 24th Farwardi 1343 F. (25th February 1934).

*Transplanting.*—Single seedlings of Texinal paddy about a month old were transplanted in all the plots on the 9th Isfandar 1343 F. (11th January 1934).

*Irrigation.*—The plots were irrigated every alternate day until about 10 days before harvest; when watering was stopped to let the plots dry.

*Growth.*—Growth in all plots was good. Some lodging was noticed in later stages of growth in the plots treated with Nicifos, Ammonium Sulphate and Superphosphate. Nicifos treated crop had better tillers and height than the crop in other plots.

*Weeding.*—One weeding was done on the 17th Farwardi 1343 F. (18th February 1934).

*Pests and Diseases.*—Slight attacks of Stem-borer and Hispa were observed.

*Harvesting.*—The reaping of the crop in all plots was done on the 27th Khurdad 1343 F. (1st May 1934).

*Yields.*—The statement showing the average yields in lbs. per acre follows:—

AVERAGE YIELDS CALCULATED IN LBS. PER ACRE

Details of treatment	A b i				T a b i			
	1341-1342 F.		1342-1343 F.		1341-1342 F.		1342-1343 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
Farmyard manure alone .. ..	2,985	6,360	2,820	2,380	884	3,060	1,710	1,730
Farmyard manure plus Ammonium Sulphate plus Superphosphate.	3,150	6,810	2,485	2,495	1,125	4,295	2,315	2,230
Farmyard manure plus Nicifos .. ..	3,204	7,980	2,805	3,015	1,350	4,495	2,620	2,630

The above results are decidedly in favour of the application of Nicifos both in Abi and Tabi seasons.

### EXPERIMENT NO. 2.—*Rotation Experiment with Chalka Soil.*

*Object.*—To demonstrate the value of the proper rotation of crops.—

The experiment was started in the year 1340–41 with 2 rotations, *viz.*, (a) Four years rotation, and (b) three years rotation.—A two years rotation was introduced in the experiment during the year under review.

#### (a) *Four years rotation experiment.*

The experiment consists of four crops rotated as follows:—

Ground-nuts—Jowar—Tur—Castor.

The Jowar crop only to be manured.

Plots 1/10 acre each in area are arranged in four series of 4 plots each. The series rotate in couples.

*Soil.*—Chalka.

*Preparatory tillage.*—Two ploughings and one harrowing were done. First ploughing was done on the 6th Khurdad 1342 F. (10th April 1933); and the second on the 27th Thir 1342 F. (1st June 1933). Harrowing was done on the 3rd Amerdad 1342 F. (8th June 1933).

*Manuring.*—The plots for jowar were manured at 1,200 lbs. of compost per plot.

*Sowings.*—Jowar, Ground-nuts, and Tur crops were sown in their respective plots on the 23rd Amerdad 1342 F. (28th June 1933) and Castor was sown on the 8th Shahrewar 1342 F. (14th July 1933).

The seeds of the various crops were sown at the distances shown below.—

Ground-nuts (Kanki No. 17)	.. 12" × 9"
Jowar (Local Yellow)	.. 18" × 12"
Tur (Local)	.. 36" × 18"
Castor (Bulk selections)	.. 36" × 18"

Jowar was sown with seed drill, while the seeds of all other crops were hand dibbled.

*Germination and growth.*—Satisfactory.

*Interculture.*—Ground-nuts, Jowar, and Tur were given one weeding each, Castor was weeded twice.

One hoeing with Norcross was given to each of the Ground-nuts, Jowar and Tur plots. Two hoeings with cultivator were given to Castor plots and 3 to Tur plots.

*Rainfall and Irrigation.*—The crops were grown on rain only. No irrigation was done. The rainfall received by each crop during its growing period is shown below:—

Ground-nut (Kanki No. 17)	.. 36.03"
Jowar (Local Yellow)	.. 36.22"
Tur (Local)	.. 40.86"
Castor (Bulk selections)	.. 27.89"

*Pests and Diseases.*—Slight attacks of stem-borer on Jowar, white ants on Tur, and Semilooper on Castor respectively.

*Harvesting.*—Ground-nuts were dug on the 17th Azur 1343 F. (22nd October 1933). Jowar was reaped on the 5th Dai 1343 F. (9th November 1933). Tur was harvested on the 29th Bahman 1343 F. (1st January 1934). Castor pickings continued up to the 28th Ardi-behisht 1343 F. (1st April 1934).

Yields calculated in lbs. per acre are given in the statement below:—

Name of crop	AVERAGE YIELD CALCULATED IN LBS. PER ACRE		
	1340-1341 F.	1341-1342 F.	1342-1343 F.
Ground-nuts ..	2,292	1,890	1,485
Jowar .. ..	887	1,870	872
Tur .. ..	835	965	822
Castor .. ..	912	650	945

REMARKS.—The above are the results of 3 years of experiment. No definite conclusion can be drawn so far.

(b) *Three years rotation experiment.*

The experiment consists of three crops rotated as follows:—

Ground-nuts—Jowar—Castor.

The Jowar crop only to be manured.

The plots are arranged on Latin Square method. Area of each plot being 1/10th of an acre.

*Soil.*—Chalka.

*Preparatory tillage.*—Two ploughings and one harrowing were done in all fields. Ploughings were done in Khurdad (April) and Thir (May); and the harrowing was done in the beginning of Amerdad 1342 F. (June 1933).

*Manuring.*—The plots for Jowar were manured with 900 lbs. of compost per plot.

*Sowings.*—Jowar and Ground-nuts were sown in their respective plots on the 23rd Amerdad 1342 F. (28th June 1933). Castor was sown on the 8th Shahrewar 1342 F. (14th July 1933).

The seeds of the various crops were sown at the following distances.—

Ground-nuts (Kanki No. 17)	..	12" × 9"
Jowar (Local Yellow)	..	18" × 12"
Castor (Bulk selections)	..	36" × 18"

Jowar was sown with seed drill while Castor seeds were hand dibbled.

*Germination and growth.*—Germination was good, and the growth satisfactory.

*Weedings and Interculture.*—Two weedings were done in all plots. Castor crop was given 2 hoeings in addition.

*Rainfall and Irrigation.*—No irrigation was applied. The various crops received the following amounts of rainfall during the periods of their growth.—

Ground-nuts (Kanki No. 17)	..	36.03"
Jowar (Local Yellow)	..	36.22"
Castor (Bulk selections)	..	27.89"

*Pests and Diseases.*—Jowar was attacked by stem-borer and Castor by semilooper. Control measures were adopted in time and no appreciable damage was done.

*Harvesting.*—Ground-nuts were dug on the 17th Azur 1343 F. (22nd October 1933). Jowar was reaped on the 7th Dai 1343 F. (11th November 1933), while the Castor pickings continued up to the 28th Ardibehisht 1343 F. (1st April 1934).

The following statement shows the yields calculated in lbs. per acre.—

Name of crop	AVERAGE YIELD IN LBS. PER ACRE		
	1340-1341 F.	1341-1342 F.	1342-1343 F.
Ground-nuts ..	2,753	1,546	1,507
Jowar .. ..	273	1,033	413
Castor .. ..	460	490	501

The above are the results of three years of experiment. No definite conclusions can be drawn so far.

(c) *Two years rotation experiment.*

This experiment was started during the year under review, and consists of two crops rotated as follows:—

Jowar—Castor.

The Jowar crop only to be manured.

Four replications of each crop are arranged in eight plots each measuring  $1/10$ th of an acre in area.

*Soil.*—Chalka.

*Preparatory tillage.*—Three ploughings and four harrowings were done in all.

*Manuring.*—The plots for jowar were manured with 600 lbs. of compost per plot on the 24th Thir 1342 F. (29th May 1933).

*Sowings.*—Jowar was drilled in lines 18" apart on the 23rd Amerdad 1342 F. (28th June 1933). Castor was hand dibbled 18" apart in rows 36" apart. Jowar plants were later thinned to about 12" apart.

*Germination and growth.*—Germination was good. Growth was rather uneven owing to the field having been recently levelled.

*Weeding and Interculture.*—Two weedings were done in all plots. Castor plots were given two hoeings with cultivator in addition.

*Rainfall and Irrigation.*—No irrigation was given. The Jowar crop received 36.22" of rainfall during the period of its growth, while Castor received 27.89 inches.

*Pests and Diseases.*—Slight attack of stem-borer on Jowar and semilooper on Castor.

*Harvesting.*—Jowar was reaped on the 5th Dai 1343 F. (9th November 1933) while the last picking of Castor was accomplished on the 29th Ardibehisht 1343 F. (2nd April 1934).

The following statement shows the yields calculated in lbs. per acre.—

Name of crop	YIELDS CALCULATED IN LBS. PER ACRE				
	1st Series	2nd Series	3rd Series	4th Series	Average
Jowar (Local Yellow)	100	440	780	840	540
Castor (Bulk selections).	775	1,216	771	996	940

The above are the results of the first year of the experiment.

### EXPERIMENT NO. 3.—*Comparison of Kharif Jowar varieties.*

*Object.*—Eleven varieties of Jowar were grown to find out the most profitable variety for the tract.

*Soil.*—Chalka.

*Preparatory tillage.*—Five ploughings and three harrowings were done altogether.

*Plotting.*—44 plots each measuring  $55' \times 12' = 1/66$  of an acre were made in a field. Plots were separated from each other by 4' wide pathways left between.

*Manuring.*—The whole field was manured at 6,000 lbs. of compost per acre on the 19th Thir 1342 F. (24th May 1933).

*Sowings.*—The Sulphur treated seeds of the different varieties were drilled in their respective plots in rows 18" apart on the 14th Amerdad 1342 F. (19th June 1933). The plants were thinned to 12" apart in lines on the 23rd Shahrewar 1342 F. (29th July 1933).

*Germination and growth.*—Germination was good in all varieties. Some gap filling, however, was done on the 26th Amerdad 1342 F. (1st July 1933). Growth was good.

*Weedings and Interculture.*—Three hoeings were done in all, the first with Norcross, and the latter two with cultivator.

*Rainfall and Irrigation.*—No irrigation was given. Californian Dwarf received 34.14" of rain, while all other varieties received 36.94".

*Pests and Diseases.*—The stem-borer was a slight pest but could not do any appreciable damage owing to the control measures having been adopted in time.

*Harvesting.*—Californian Dwarf was the earliest to mature and was reaped on the 1st Azur 1343 F. (6th October 1933) and was only 4' in height.

The following statement shows the ripening and harvesting dates of the various varieties together with their height, etc.

Name of variety	Date of ripening	Height	Days for maturity
1. Aishpuri .. ..	10-2-1343 F.	8'	149
2. Californian Dwarf ..	1-1-1343 F.	4'	110
3. Cawnpore Dodania ..	28-1-1343 F.	9'	137
4. Gadgiri .. ..	14-2-1343 F.	9'	153
5. Ilaspuri .. ..	10-2-1343 F.	10'	149
6. Kodaldani .. ..	7-2-1343 F.	9'	146
7. Local, white .. ..	7-2-1343 F.	8'	146
8. Local, yellow .. ..	7-2-1343 F.	8'	146
9. Pocha Junna .. ..	7-2-1343 F.	8½'	146
10. Ram Kel .. ..	10-2-1343 F.	10'	149
11. Saoner .. ..	14-2-1343 F.	9'	153

The following statement shows the average yields per acre.

Name of variety	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE									
	1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Aishpuri ..	..	..	..	..	1,220	11,580	2,110	12,500	1,435	14,685
2. Californian Dwarf ..	910	8,920	1,533	9,973	980	4,910	1,630	9,320	660	7,491
3. Cawnpore Dodania ..	1,390	6,625	2,319	15,679	1,620	11,640	1,880	9,660	1,452	9,141
4. Gadgiri ..	1,145	7,350	1,253	25,693	1,390	8,880	1,730	20,600	330	18,051
5. Ilaspuri ..	735	4,650	1,560	19,880	880	14,240	1,520	17,560	561	18,962
6. Kodaldani ..	..	..	..	..	..	..	2,320	10,820	1,468	10,197
7. Local, white ..	1,500	5,880	2,066	12,026	660	7,760	2,390	9,820	1,072	7,837
8. Local, yellow ..	1,365	5,325	2,360	11,603	1,360	10,080	2,270	12,420	1,716	10,791
9. Pocha Junna ..	1,330	4,220	1,692	12,653	1,120	8,480	2,090	11,300	990	9,735
10. Ram Kel ..	..	..	..	..	1,320	11,120	1,580	18,000	1,056	15,048
11. Saoner ..	1,600	10,765	1,821	21,710	880	13,520	1,420	18,020	792	16,170

Gidgap was discarded from the experiment during the year under review, because it gave very little yield of grain. Californian Dwarf will be discarded next season.

#### EXPERIMENT No. 4.—*Comparison of Bajra varieties.*

*Object.*—Seven varieties of Bajra were tried to find out a most profitable variety for the tract.

*Soil.*—Chalka.

*Preparatory tillage.*—One ploughing and 3 harrowings were done.

*Plotting.*—28 plots measuring  $1/44$  acre each in area were made to allow of 4 replications of the varieties. The plots were well separated from each other by leaving 4' wide pathways between.

*Manuring.*—No manure was given.

*Sowings.*—The varieties were sown in their respective plots by seed drill in lines 18" apart on the 13th Shahrewar 1342 F. (19th July 1933).

*Germination and growth.*—Germination was good in all plots, and growth satisfactory.

*Weeding and Interculture.*—Thinning of the plants to 1' apart was done on the 28th Shahrewar 1342 F. (3rd August 1933). One hand weeding and one hoeing were done altogether.

*Rainfall and Irrigation.*—No irrigation was done. Behar variety received 20.64" of rain, while all other varieties received 22.96".

*Pests and Diseases.*—Nothing noteworthy. The incidence of rain and high winds at the time of flowering impaired the process of fertilisation rather seriously.

*Harvesting.*—Behar variety was the earliest to ripen and was harvested on the 13th Azur 1343 F. (18th October 1933). All other varieties were harvested about a fortnight later.

The following statement shows the yields obtained.

Name of variety	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE									
	1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Akola .. ..	..	..	586	2,174	680	3,430	2,360	8,100	682	6,446
2. Akola 14 B .. ..	..	..	..	..	1,205	8,370	2,240	10,200	704	7,700
3. Akola 32 C .. ..	..	..	..	..	1,100	8,430	2,240	11,040	605	7,150
4. Behar .. ..	..	..	..	..	..	..	1,800	5,840	484	6,336
5. Cawnpore Awneel .. ..	975	2,757	483	2,006	850	4,570	2,060	7,060	704	6,814
6. Kambo .. ..	..	..	..	..	750	8,590	1,780	11,460	583	6,688
7. Local .. ..	557	2,950	1,129	4,419	1,060	6,630	840	5,360	495	5,962

The yields of all varieties have been low during the year under review as a result of bad season at the time of seed formation.

### EXPERIMENT NO. 5.—*Comparison of Ground-nut varieties.*

*Object.*—Six varieties of Ground-nuts were grown to find out the most profitable variety.

*Soil.*—Chalka.

*Preparatory tillage.*—Three ploughings and five harrowings were done in all.

*Manuring.*—No manure was given.

*Plotting.*—24 plots of  $1/40$  acre each in area were prepared to allow of 4 replications for each variety.

*Sowings.*—Seed was dibbled 9" apart in lines 12" apart on the 6th Amerdad 1342 F. (11th June 1933).

*Germination and growth.*—Germination was satisfactory in all plots. The small seeded varieties flowered 10 days earlier than the big seeded varieties; and did form better plants.

*Weeding and Interculture.*—One hand hoeing and one hand weeding were done.

*Rainfall and Irrigation.*—No irrigation was given. The early varieties, namely, Spanish Pea-nut No. 5, Spanish Pea-nut No. 9, and Small Japan, received 39.77" of rain, while the later varieties received 42.38".

*Pests and Diseases.*—Some cut worm in early stages. Tikka disease appeared in all varieties at later stages. The damage has been negligible.

*Harvesting and Yields.*—The early varieties were dug out on the 9th Azur 1343 F. (14th October 1933) while the late varieties were harvested on the 16th Azur 1343 F. (21st October 1933).

The following statement shows the yields:—

Name of variety	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE				
	1933-1939 F.	1939-1940 F.	1940-1941 F.	1941-1942 F.	1942-1943 F.
1. Hebbal No. 1 ..	..	2,405	2,860	3,680	3,360
2. Kanki No. 17 ..	1,686	2,880	2,333	3,490	2,750
3. Madagaskar ..	..	..	3,173	3,540	2,600
4. Small Japan ..	..	..	2,160	3,340	2,870
5. Spanish Pea-nut No.5.	1,200	2,260	2,746	3,680	3,120
6. Spanish Pea-nut No.9.	..	..	2,640	3,700	3,160

# EXPERIMENT NO. 6.—*Comparison of Arhar varieties.*

*Object.*—Ten varieties of Arhar were grown to find out the most profitable variety.

*Soil.*—Chalka.

*Preparatory tillage.*—Two ploughings and 4 harrowings were done.

*Plotting.*—40 plots measuring  $1/44$  of an acre each in area were prepared separated from each other with strips left between.

*Manuring.*—No manure was given.

*Sowings.*—Seeds of all varieties were dibbled 18" apart in lines 36" apart in their respective plots on the 15th Amerdad 1342 F. (20th June 1933).

*Germination and growth.*—Germination was good in all plots; and the growth was satisfactory.

*Weedings and Interculture.*—One weeding and four hoeings were done altogether.

*Rainfall and Irrigation.*—No irrigation was done. Unao Early was the earliest to ripen and received 34.62" of rainfall; while all the other varieties received 41.58".

*Pests and Diseases.*—Hairy caterpillar, White ants, and Pod-borer attacked, and were responsible for a fair amount of damage, more especially the Pod-borer.

*Harvesting.*—Dates of the ripening and harvesting of the various varieties are given below:—

- (1) Unao Early 13th Azur 1343 F. (18th October 1933).
- (2) Coimbatore Red 25th Bahman 1343 F. (28th December 1933).
- (3) Poona Red 25th Bahman 1343 F. (28th December 1933).
- (4) Pusa E., 25th Bahman 1343 F. (28th December 1933).
- (5) Local 29th Bahman 1343 F. (1st January 1934).
- (6) Nizam Tur 29th Isfindar 1343 F. (31st January 1934).

- (7) Nagpur No. 3 7th Ardibehisht 1343 F. (11th March 1934).  
 (8) Cawnpore 7th Ardibehisht 1343 F. (11th March 1934).  
 (9) Pusa A. 2 14th Ardibehisht 1343 F. (18th March 1934).  
 (10) Pusa T.G. 14th Ardibehisht 1343 F. (18th March 1934).

*Yields.*—The following statement shows the yields per acre:—

Serial No.	Name of variety	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE			
		1939-1940 F.	1940-1941 F.	1941-1942 F.	1942-1943 F.
1.	Cawnpore ..	188	464	1,457	857
2.	Coimbatore Red ..	..	912	1,760	770
3.	Local ..	767	726	1,801	946
4.	Nagpur ..	..	1,856	1,081	217
5.	Nizam Tur ..	..	..	907	370
6.	Poona Red ..	..	1,040	1,787	968
7.	Pusa A-2 ..	..	672	948	242
8.	Pusa E. ..	..	1,282	2,076	941
9.	Pusa T. G. ..	..	..	921	257
10.	Unao Early ..	..	..	550	808

#### EXPERIMENT NO. 7.—*Comparison of Kharif Cotton varieties.*

*Object.*—Eight varieties of Cotton were grown to observe their behaviour in rainfed chalka soil, and to find out a profitable variety.

*Soil.*—Red chalka.

*Preparatory tillage.*—Two ploughings and one harrowing were done.

*Plotting.*—32 plots measuring  $66' \times 10' = 1/66$  of an acre each in area were made to allow 4 replications of the varieties.

*Manuring.*—No manure was given.

*Sowings.*—Seeds of all varieties were hand dibbled in their respective plots on the 14th Amerdad 1342 F. (19th June 1933). The distance for Coimbatore Nos. 1 and 2 was 30"×24" while for all other varieties 24"×18".

*Germination and growth.*—Germination was good in all plots excepting those of Coimbatore No. 1. Gap filling was done on the 24th Amerdad 1342 F. (29th June 1933). Growth was good and better stimulated with by the excess of rains; with the exception of Coimbatore No. 1 which was rather adversely affected.

*Weedings and Interculture.*—One weeding and 4 hoeings were done.

*Rainfall and Irrigation.*—No irrigation was done. Coimbatore Nos. 1 and 2 received 44.19" of rain, while all others received 41.58" only.

*Pests and Diseases.*—Aphis and Jassids were prominent. The Hairy Caterpillar and cut worm did also do some damage.

*Harvesting.*—The pickings of Coimbatore Nos. 1 and 2 were completed on the 20th Khurdad 1343 F. (24th April 1934) while those of all others were completed on the 7th Khurdad 1343 (11th April 1934).

*Yields.*—The following statement shows the yields of seed cotton:—

Name of variety	AVERAGE YIELD OF SEED COTTON PER ACRE	
	1341-1342 F.	1342-1343 F.
1. Coimbatore No. 1 .. ..	456	182
2. Coimbatore No. 2 .. ..	470	715
3. Gaorani No. 2 .. ..	..	781
4. Gaorani No. 9 .. ..	..	814
5. Gaorani No. 12 .. ..	..	758
6. Gaorani No. 13 .. ..	..	646
7. Western (Higari) .. ..	370	745
8. Kumpta (Dharwar No. 1) ..	585	687

The above results are surely in favour of trial being given to the cotton cultivation in rain-fed Chalka areas.

## EXPERIMENT NO. 8.—*Comparison of Wheat varieties.*

*Object.*—Twelve varieties of Wheat were grown to find out the most profitable variety.

*Soil.*—Medium Regur.

*Preparatory tillage.*—Four ploughings and two harrowings were done.

*Plotting.*—The field was divided into 48 long strips comprising an area of  $1/120$  acre each. The varieties were replicated 4 times.

*Manuring.*—Castor-cake at 800 lbs. per acre was applied on the 17th Aban 1342 F. (22nd September 1933).

*Sowing.*—The seeds of the various varieties were sown in their respective plots with American seed drill in rows 9" apart on the 3rd Azar 1343 F. (8th October 1933).

*Germination and growth.*—Germination was good and growth satisfactory in all plots.

*Weedings and Interculture.*—Two hoeings with Norcross were done.

*Rainfall and Irrigation.*—Two irrigations in addition to 7.44" of rain were given.

*Pests and Diseases.*—All varieties got rusted. Pusa 4 and Pusa 111 behaved slightly better. Sharbati was attacked by smut, and Shet Parner by alternaria.

*Harvesting.*—Pusa Nos. 4, and 111 were the earliest to ripen and were reaped on the 2nd Farwardi 1343 F. (3rd February 1934). Bansi, Pusa 80/5, and Sharbati ripened about a week later and were reaped on 10th Farwardi 1343 F. (11th February 1934). Cawnpore 13, and A.O. 88 were reaped on the 17th Farwardi 1343 F. (18th February 1934) A.O. 85, and A.O. 13 were reaped on the 18th Farwardi 1343 F. (19th February 1934). A.O. 90 was reaped on the 19th Farwardi 1343 F. (20th February 1934), and A.O. 115 a day later.

The following statement shows the yields.

Name of variety		AVERAGE YIELDS IN LBS. PER ACRE									
		1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. A. O. 13	..	..	..	..	..	..	..	..	..	2,206	3,75
2. A. O. 85	..	..	..	..	..	..	..	1,840	2,680	1,747	2,640
3. A. O. 88	..	..	..	..	..	..	..	..	..	2,068	2,520
4. A. O. 90	..	..	..	..	..	..	..	1,460	2,080	1,728	3,000
5. A. O. 115	..	..	..	..	..	..	..	1,900	2,440	2,113	3,390
6. Bansi	..	720	1,093	1,080	2,520	440	1,840	2,000	2,080	2,170	3,300
7. Cawnpore No. 13.	813	1,033	1,470	1,830	1,440	3,540	1,900	2,360	1,991	2,640	
8. Pusa 4	..	833	1,353	1,510	8,040	1,100	2,680	1,660	1,720	1,462	1,980
9. Pusa 80/5.	..	..	..	..	..	1,090	3,330	1,500	2,120	1,596	2,190
10. Pusa 11	..	..	..	..	..	1,460	2,960	1,540	1,600	1,245	1,890
11. Sharbati	..	899	1,792	1,020	2,400	900	3,820	1,700	2,360	2,164	3,060
12. Shet Parner	..	..	..	..	..	460	2,400	820	1,640	736	1,901

NOTE.—Jalali and E. B. 38 were discarded during the year under review the former for its lesser yield and the latter for its liability to smut. Two new varieties A. O. 13 and A. O. 88 were included instead.

#### EXPERIMENT NO. 9.—*Comparison of Gram Varieties.*

*Object.*—Eight varieties of Gram were grown to find out the most profitable variety.

*Soil.*—Medium Regur.

*Preparatory tillage.*—Four ploughings and five harrowings were done.

*Plotting.*—The field was divided into 32 long strips each measuring  $1/60$  acre in area. The varieties were replicated 4 times.

*Manuring.*—No manure was applied.

*Sowings.*—Seeds were sown with the American seed drill in lines 9" apart on the 21st Azur 1343 F. (26th October 1933).

*Germination and growth.*—Germination was good and growth satisfactory in all varieties.

*Weedings and Interculture.*—One hoeing with Norcross was done on the 18th Dai 1343 F. (22nd November 1933).

*Rainfall and Irrigation.*—No irrigation was done. The rainfall during the growing period of the crops amounted to 4.64".

*Pests and Diseases.*—There was a slight attack of cut worms in the early stages. Pod-borer was also noticed but did not do any appreciable amount of damage.

*Harvesting.*—The harvesting started with Bengal, Poona and Hyderabad local varieties on the 30th Farwardi 1343 F. (3rd March 1934). Sabour No. 4, Pusa 17, and Pusa 25 were reaped a day later. Pusa 28, and Cawnpore were the latest of all and were reaped on the 5th Ardibehisht 1343 F. (9th March 1934).

*Yields.*—The following statement shows the yields calculated in lbs. per acre:—

Name of variety	AVERAGE YIELDS IN LBS. PER ACRE									
	1338-1339 F.		1339-1340 F.		1340-1341 F.		1341-1342 F.		1342-1343 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Bengal .. ..	..	..	..	..	1,030	1,850	1,256	1,306	731	690
2. Cawnpore .. ..	311	876	266	653	1,200	1,520	506	1,173	860	945
3. Hyderabad, Local .	518	1,833	550	633	1,010	1,830	973	1,120	748	720
4. Poona .. ..	..	..	..	..	810	1,180	1,186	1,466	604	555
5. Pusa 17 .. ..	..	..	..	..	860	2,880	667	1,813	776	1,365
6. Pusa 25 .. ..	548	929	546	773	480	2,120	626	2,053	754	975
7. Pusa 28 .. ..	..	..	..	..	640	1,580	626	1,226	803	1,035
8. Sabour No. 4 .. ..	517	1,282	526	946	850	1,730	973	1,573	900	1,425

#### EXPERIMENT NO. 10.—*Comparison of Rabi Jowar varieties.*

*Object.*—Four varieties were tried to select the most profitable variety.

*Soil.*—Medium Regur.

*Preparatory tillage.*—Four ploughings and two harrowings were done.

*Plotting.*—Sixteen plots measuring half a guntha  $1/80$  acre each in area were prepared to allow of 4 replications.

*Manuring.*—Compost at 6,000 lbs. per acre was applied on the 10th Aban 1342 F. (15th September 1933).

*Sowing.*—Seed was drilled in rows 18" apart with the American seed drill on the 2nd Azar 1343 F. (7th October 1933).

*Germination and growth.*—Germination was good in all plots and growth satisfactory.

*Weedings and Interculture.*—The plants were thinned to about a foot apart on the 23rd Azar 1343 F. (28th October 1933).

*Rainfall and Irrigation.*—No irrigation was given but the varieties received 7.44" of rainfall during the period they were in the field.

*Pests and Diseases.*—Nothing very noteworthy. Slight attack of stem-borer.

*Harvesting.*—Californian Dwarf was the first to mature and was reaped on the 2nd Farwardi 1343 F. (3rd February 1934). All other varieties were reaped on the 1st Ardibehisht 1343 F. (5th March 1934).

*Yields.*—The following statement shows the yields calculated in lbs. per acre:—

Name of variety	AVERAGE YIELDS IN LBS. PER ACRE									
	1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Californian Dwarf .	..	..	..	..	..	..	1,020	3,960	497	2,920
2. Maldandi .	..	..	..	..	1,008	6,531	1,600	7,960	1,044	4,820
3. Markhandi .	352	1,520	930	6,450	985	5,670	1,930	9,920	759	3,860
4. Sai Junna .	328	2,080	590	5,910	620	7,077	1,490	8,260	572	4,840

*Non-experimental crops.*—Some fodder and general crops were grown in fields not occupied by the experiment in order to secure fodder supply for the cattle, or study of the behaviour or supply of seed. The following statement shows the outturns of such crops together with the areas under each:—

Name of crop	AREA		ACTUAL OUTTURN IN lbs.			Remarks
	Acres	Gunth- as	Grain	Fodder		
				Green	Dry	
1. Arhar.						
Local ..	7	..	2,883	..	..	
Poona Red ..	..	2½	51	..	..	
2. Bajra.						
Cawnpore awned ..	1	8½	513	..	2,096	
Local (fodder) ..	2	..	..	8,160	..	
3. Castor E. B. ..	1	..	257	..	..	
4. Cotton ..						
Gaorani No. 2 ..	..	4½	65	..	..	Seed cotton.
Gaorani No. 12 ..	..	4½	53	..	..	do
5. Gram (Sabour No. 4)	1	..	640	..	..	
6. Ground-nuts						
Kanki No. 17 ..	..	4	300	..	..	Dry nuts.
Madagaskar ..	..	1	44	..	..	do
Spanish Pea-nut						
No. 5 ..	1	..	3,362	..	..	do
7. Guinea grass ..	..	18	..	6,604	..	
8. Jowar Kharif.						
Californian Dwarf ..	..	24	166	..	2,048	
Cawnpore Dodania ..	..	30	694	..	5,720	
Local, white ..	..	10	86	..	488	
Local, yellow ..	8	21	..	..	50,892	
Sundia ..	1	..	..	3,780	..	
9. Jowar Rabi Sai Junna						
Fodder ..	2	..	..	12,880	..	
Seed ..	2	..	546	..	6,397	
10. Lucerne ..	..	20	..	3,096	..	
11. Maize, Local ..	..	3	28	..	145	
12. Oats seed ..	..	3	84	..	114	
Fodder ..	..	20	..	3,400	..	
13. Paddy Abi No. 504 ..	..	22	1,202	..	2,091	
Texinal ..	..	2½	183	..	220	
14. Paddy Tabi No. 504 ..	..	22	1,378	..	1,082	
15. Tobacco						
Guntur broad leaf ..	1	..	..	..	104	Dry leaves.
16. Urid (Local) ..	1	20	585	..	..	
17. Wheat Pusa 4 ..	1	5	690	..	833	

An area of 2 acres for paddy and one acre for castor was placed under the Economic Botanist for carrying out various tests.

*Permanent Improvements.*—Levelling of the un-irrigated areas has been continued during the months when the lands were fallow.

*Buildings.*—A portion of the Ganj wall together with a corner tower had fallen down in rainy season. Repairs were effected.

The permanent staff quarters for the Kamgars and Menials are under construction by the P.W.D.

*Cattle.*—One pair was disposed off having grown very old. A new pair was purchased as a replacement. All cattle kept in good health.

*Manure pits.*—Preparation of compost continued throughout the year. Slight improvements in the pits were effected during the year.

*Implements.*—The following additions and replacements were made during the year.—

Corn Planter	..	..	1
Drag Scrapers	..	..	4
Fire Extinguisher	..	..	1
Bin for storing grain	..	..	6
Tarpurlins	..	..	2
Turnpikes	..	..	2
Gate	..	..	1

In addition spare parts were purchased to replace the wear and tear as necessary.

*Finances.*—Total expenditure during the year under review amounted to Rs. 7,426-1-4; which includes Rs. 2,162-10-9 on account of the purchase of implements and Rs. 175-3-4 on account of the purchase of a pair of cattle.

The Farm income amounted to Rs. 781-10-9.

*Charge and Establishment.*—Mr. Sitaram Pershad was in charge of the Farm throughout the year excepting for a period of one month and 23 days when he availed of privilege leave and Mr. Ihsan Hussain officiated for him.

The Assistant Farm Superintendent, Mr. Jagan Nath Reddy was transferred to Raichur as Horticultural Assistant, and Mr. Mohomed Ali Khan took over charge from him on the 10th Bahman 1343 F. (13th December 1933).

I wish to place on record my appreciation of the work done by Mr. Sitaram Pershad as Superintendent of the Farm.

(Sd.) A. SOOFEE,

*Deputy Director of Agriculture,  
Western Telingana Division,  
Himayatsagar, Hyderabad-Deccan.*

*Statement showing the record of rainfall at the Agricultural Experimental Farm, Sangareddy, for the year 1842-1843 Fashi.*

## RAINFALL IN INCHES

Date	Amerdad	Shahrewar	Mehir	Aban	Azur	Dai	Pahmon	Isfin-dar	Farwardi	Ardebehisht	Khurdad	Thir
1	..	0.81	..	0.09	0.41	..	..	..	..	..	..	..
2	..	1.45	..	0.16	..	..	..	..	..	..	..	..
3	0.46	1.24	..	2.41	..	..	..	..	..	..	..	..
4	..	0.45	0.81	0.10	..	..	..	..	..	..	..	..
5	1.24	1.90	0.09	1.00	..	..	..	..	..	..	..	..
6	..	0.10	..	0.85	..	..	..	..	..	..	..	..
7	0.47	..	..	..	..	..	..	..	..	..	..	..
8	0.80	0.32	..	0.11	..	..	..	..	..	..	..	..
9	0.50	..	..	..	..	..	..	..	..	..	..	..
10	1.00	0.19	..	..	0.48	..	..	..	..	..	..	..
11	..	0.09	..	0.29	..	..	..	..	..	..	..	..
12	0.77	0.33	..	..	..	..	..	..	..	..	..	..
13	2.09	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	1.58	1.24	..	..	..	..	0.50	..
15	..	..	..	..	0.55	0.26	..	..	..	..	0.86	..
16	..	..	..	..	..	..	..	..	..	..	1.25	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	0.95	..	0.19	..	..	..	..	..	..	..
19	..	..	0.52	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	1.31	..	..	..	..	..
21	..	0.70	..	..	..	..	1.08	..	..	..	..	..
22	0.16	0.59	..	..	..	..	0.80	..	..	..	..	..
23	0.56	0.56	..	..	..	..	..	..	..	..	..	..
24	2.66	1.10	0.80	..	..	..	..	..	..	..	..	..
25	1.90	1.04	0.46	..	..	..	..	..	..	..	..	..
26	1.37	4.07	..	..	..	..	..	..	..	..	..	..
27	0.45	0.65	..	..	..	..	..	..	..	..	..	..
28	..	..	1.80	..	..	..	..	..	..	..	..	..
29	..	0.80	0.08	..	..	..	..	..	..	..	..	..
30	..	0.10	0.12	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..
Grand total	14.43	16.49	5.13	5.01	3.21	1.50	3.14	..	..	..	2.61	..

Grand total for the whole year is 51.52".

*Agricultural Experimental Farm, Sangareddy.*

The Programme of Research and Experimental work to be carried out for the year 1343-1344 F., is as follows:—

1. Manurial Experiment with Nicifos on Paddy.
2. Rotation Experiment with Chalka soil.
3. Comparison of Kharif Jowar varieties.
4. Comparison of Bajra varieties.
5. Comparison of Ground-nut varieties.
6. Comparison of Arhar varieties.
7. Comparison of Kharif Cotton varieties.
8. Comparison of Wheat varieties.
9. Comparison of Gram varieties.
10. Comparison of Rabi Jowar varieties.

*Annual Report of the Government Experimental Farm,  
Rudroor, for the year 1342-43 F.*

*Introduction.*—The land for this farm was acquired in the year 1340 F., and work was started in 1341 F. The year under review has been the second year of the working of the farm. During this period most of the preliminary work consisting of the lay-out, and rigorous levelling of the fields has been accomplished; and the farm is getting into an established condition.

*Situation.*—The Rudroor farm is situated about a mile to the south of the village of the same name, along the southern side of the main road from Nizamabad to Banswada. The road is good and connects the Farm with Nizamabad Railway Station on H.E.H. the Nizam's Metre Gauge Railways with a distance of about 22 miles. Regular Railway Bus Service runs on the road twice daily.

A range of hilly mounds forms the south-eastern boundary of the farm. All other sides are bounded by open plains. The land slopes gently towards western side; and is well drained.

The P.W.D. Inspection Bungalow lies inside the periphery of the farm area, and proves very useful for the Inspecting officers, and visitors to the farm.

*Object.*—Rudroor farm replaced the small experimental area at Nizamsagar, which had temporarily been taken over in 1338 F., the object of the experimental work being to investigate the problem of the best economic use of the immense quantity of water stored in the gigantic reservoir of Nizamsagar, in raising valuable crops more especially sugar-cane.

*Soil.*—The soil at Rudroor consists of both Regur (black cotton soil) and chalka in well-defined patches, and is representative of soils met with in the areas commanded by the Nizamsagar Project.

*Area.*—The total area of the farm may roughly be taken at 65 acres. Out of which an area of 43 acres has been laid out in proper fields for experimental work.

This area consists of 19 acres of chalka land and 24 acres of Regur. The whole of this area is under irrigation.

*Source of irrigation.*—The farm is irrigated by a distributary 30/1 of Warni Canal from Nizamsagar. Water supply has been ample throughout the year. It is, however, proposed to make some arrangement for summer irrigation when the canal is expected to be closed for silt clearance. There exists an old finely built well in the farm area and it is intended to explore the possibilities of this well for summer irrigation during the period of closure of the canals. A pump is being installed on the well for raising water into an overhead tank to insure easy distribution into the fields.

*Season.*—The total rainfall during the year amounted to 45.56 inches. The downpours were so excessive and continuously intermittent during the season that the lands kept constantly moist and tended to get water-logged.

The temperature started rising towards the end of Khurdad and in Thir it rose to 114° F. in shade. This incidence of hot winds was a common feature of those months. A high wind storm on the 13th Khurdad 1343 F., was responsible for considerable damage on the farm.

*Experiments and cropping.*—It will be a matter of another few years to get the fertility and uniformity of the newly levelled fields established. The crops grown during the year under review exhibited a patchy appearance, which has been the natural result of scraping the high mounds and filling the depressions.

However the experimental work has been continued and the results are tabulated in the following pages.—

#### EXPERIMENT NO. 1.—*Sugar-cane Manurial Tests.*

*Object.*—To find out the optimum manurial requirements of the sugar-cane crop.

*Soil.*—Light chalka.

*Preparatory tillage.*—The field was levelled in the previous year, and a crop of sunn hemp was grown and was ploughed in for green manure. The land was ploughed, harrowed, disced, and trenches made preparatory for planting in the first fortnight of Isfindar 1342 F. (January 1933).

*Area and plotting.*—One acre of area was set apart for this experiment. Sixteen plots of 2 gunthas each in area were located in 4 rows well-separated from each other. Fair sized foot-paths were left to separate the plots from each other in the rows.

*Manuring.*—The following scheme of manuring was adopted:—

1. Castor-cake at 2,400 lbs. per acre  
plus Ammonium Sulphate at 150 lbs. per acre.
2. Castor-cake at 2,000 lbs. per acre  
plus Ammonium Sulphate at 125 lbs. per acre.
3. Castor-cake at 1,600 lbs. per acre  
plus Ammonium Sulphate at 100 lbs. per acre.
4. Castor-cake at 1,200 lbs. per acre  
plus Ammonium Sulphate at 75 lbs. per acre.

Each of the above-mentioned treatments was replicated 4 times in plots distributed according to the Latin Square method.

The desired quantity of castor-cake was made up in two equal applications in each plot, the first dressing was done just before planting and the second a month afterwards.

Ammonium Sulphate was applied in desired quantities at the time of the filling of trenches on the 19th Amerdad 1342 F. (24th June 1933).

*Sowings.*—Planting was done on the 16th Isfindar 1342 F. (18th January 1933) in the usual manner by burying the cane sets end to end about 2" deep in the centre of the trenches keeping the eye-buds sideways and irrigating just after the operation was completed. The variety used was Co. 213 and the seedrate employed was about 10,000 sets to the acre.

*Germination.*—Sprouting of the shoots started on the 30th Isfindar 1342 F. (1st February 1933) and gap filling was done on the 25th Farwardi 1342 F. (26th February 1933) which amounted to about 20 per cent.

*Weedings, hoeings, earthings, etc.*—Altogether 9 hoeings, and 2 earthings were done. The hoeings also included weedings. First earthing was done towards the end of Amerdad 1342 F. (June 1933). Second earthing was done in the month of Dai 1343 F. (November 1933).

Uprooting of striga parasite was regularly done at the time of each hoeing from the beginning of the rainy season onwards.

*Irrigations.*—Owing to the light and porous nature of the soil, the field kept in good condition of moisture due to seepage from the canal. Only five irrigations were done before the advent of the rains. Total rainfall received by the crop amounted to 51.20".

*Growth.*—The growth was far better than that of the previous year, though not in any way ideal. Tillering was good. Flowering started in the last week of Azur 1343 F. (October 1933).

*Pests and diseases.*—White-ants and field-rats were responsible for a slight damage to the crop. Striga parasite appeared in the field in large numbers and was kept under constant check by uprooting.

*Harvesting and yields.*—The crop was harvested from the 24th Bahmon 1343 F. (27th December 1933) to 5th Isfindar 1343 F. (7th January 1934). The canes were crushed in Chattanooga Power Driven Mill and the juice was boiled to gur in Hadi's Improved Furnace.

The following statement shows the average yields of gur obtained per acre:—

Treatment	YIELD PER ACRE IN lbs.			
	1341-1342 F.		1342-1343 F.	
	Stripped Cane	Gur	Stripped Cane	Gur
2,400 lbs. Castor Cake plus 150 lbs. Ammonium Sulphate.	43,045	4,577	105,770	10,762
2,000 lbs. Castor Cake plus 120 lbs. Ammonium Sulphate.	38,600	3,957	98,145	10,550
1,600 lbs. Castor Cake plus 90 lbs. Ammonium Sulphate .	38,667	3,762	98,015	9,870
1,200 lbs. Castor Cake plus 60 lbs. Ammonium Sulphate .	30,317	3,165	89,222	9,760

## EXPERIMENT NO. 2.—*Comparison of sugar-cane varieties.*

*Object.*—To find out the most profitable variety of sugar-cane suitable to the local conditions.

*Soil.*—Light chalka.

*Preparatory tillage.*—Two ploughings with heavy inverting plough each followed by harrowing, discing and Patha were carried out from the middle of Azur 1342 F. (October 1932) to the end of Bahmon 1342 F. (December 1932). Ridges were made 4' apart from the 3rd to 13th Isfindar 1342 F. (5th to 15th January 1933).

*Area and plotting.*—Thirty-four plots of 2 gunthas each in area were prepared well separated from each other by fair sized footpaths and channels. Nine varieties of thick canes were grown in duplicate plots while 4 varieties of medium Coimbatore canes were located in 16 plots on Latin Square Method of distribution.

A good crop of sunn hemp was grown and ploughed in the field as green manure in previous Kharif season.

*Manuring.*—Castor-cake at 40 mds. per acre was applied in two equal dressings. The first dressing of 20 mds. per acre was applied a week before planting. The second dressing was applied a month after the first application. The cake was applied in powder form, and was well mixed into the soil with the help of Norcross and "Kumkis." The manurial treatment was quite uniform in all plots.

*Sowings.*—Sets of canes consisting of 3 nodes each were planted end to end about 2" deep in the middle of the furrow keeping the eye buds sideways. The furrows had been irrigated 4 days earlier and the seed bed was quite moist at the time of sowings. This operation was carried out on the 22nd and 23rd Isfindar 1342 F. (24th and 25th January 1933). The seed rates differed with different varieties according to the thickness or otherwise of the cane.

The sowing was followed with an irrigation immediately afterwards.

*Germination and growth.*—Germination was fair. Gap filling was done towards the end of Farwardi 1342 F. (February 1933). In the plots of P.O.J. 2878, P.O.J. 2725, and E.K. 28, however, a second gap filling was done in the middle of Ardibehisht 1342 F. (March 1933).

The growth was patchy in almost all the plots due to unevenness of fertility in the soil as an after effect of levelling. However the crops grew far better than those of the previous year.

*Weedings and hoeings, etc.*—Eight hoeings and 2 earthings were done in all the plots. The thick varieties were given 6 weedings while the medium ones only 3. One earthing was done in the 3rd week of Amardad 1342 F. (June 1933). The second earthing was done in the various varieties as it was found necessary from Aban 1342 F. (September 1933) to Dai 1343 F. (November 1933).

*Irrigations.*—Owing to the light and porous nature of the soil, the seepage of the canal kept the moisture in the fields for a longer time. Irrigations were given according to the needs of the crops. Altogether 7 irrigations to thick varieties and 8 irrigations to medium canes were given in addition to 51.20" of rain water.

*Pests and diseases.*—White-ants in early stages and striga from the advent of the rains were general pests. Uprooting of striga was continuously carried out. Cane-borer was noticed attacking the thick varieties. White smut was noticed in some of the Coimbatore canes more especially Co. 213. Field-rats did also appear. However, none of these pests or diseases became serious and the damage done was not much worth considering.

*Harvest and yields.*—The stand of all varieties was fairly good with the exception of H.M. 320 and D. 109 which lodged. Early shooting started in H.M. 320, P.O.J. 2725, H.M. 544; and D. 109. Flowering started in the last week of Azur 1343 F. (October 1933) in most of the varieties. Fiji B and H.M. varieties, however, did not flower at all.

The harvesting started on the 6th Isfindar 1343 F. (8th January 1934) and continued up to the 24th Isfindar 1343 F. (26th January 1934). The medium varieties

were the first to be crushed followed by the thicker canes. Crushing was done by the Chattanooga Power Crusher and gur was boiled in Modified McGlashan's pans.

The following statement shows the average yields of cane and gur in lbs. per acre.

Name of variety	1841-1842 F.		1842-1843 F.	
	Stripped Cane	Gur	Stripped Cane	Gur
Co. 218 .. ..	29,596	3,017	51,580	5,460
Co. 223 .. ..	45,596	5,170	71,455	8,220
Co. 290 .. ..	48,507	5,797	68,612	7,120
Co. 281 .. ..	39,489	4,519	55,425	6,445
P. O. J. 2714 .. ..	32,936	3,385	93,060	12,880
P. O. J. 2878 .. ..	38,444	3,836	76,520	10,840
P. O. J. 2725 .. ..	48,697	5,114	75,590	9,940
E. K. 28 .. ..	29,932	3,161	85,280	10,730
H. M. 544 .. ..	37,924	4,168	68,840	7,110
H. M. 544 striped .. ..	43,245	4,590	61,130	6,660
H. M. 320 .. ..	40,177	4,415	86,790	9,960
Fiji B. ... ..	32,557	3,885	55,630	5,630
D. 109 .. ..	47,951	4,788	72,370	8,900

### EXPERIMENT NO. 3.—*The sugar-cane planting time Experiment.*

*Object.*—To find out if the sowings at different dates will effect on the date of ripening of sugar-cane, and whether it would be possible to obtain a protracted crushing period by arranging early and late sowings, without effecting the yield or quality of gur.

*Soil.*—One set of experiment was carried out in chalka soil and the duplicate set in Regur soil.

*Preparatory tillage.*—The field was freshly levelled; and four ploughings with heavy inverting plough were given each followed by harrowing, discing, and working of "Patha." All these operations were completed by the first week of Dai 1342 F. (November 1932).

Trench making was done according to needs at different times in different plots. Intervals between the trenches were kept uniformly at 4'.

*Area and plotting.*—One 3 acre field was separated in 2 acres of chalka land and one acre of Regur soil. In chalka 36 plots of 2 gunthas each in area were made to allow of six replications of six sowings, while in Regur though the number of plots was kept the same to allow of same number of replications, the area of the individual plots was reduced to 1 guntha each. Plotting and replications were arranged according to Latin Square method.

*Manuring.*—Farm-yard manure was applied to the respective plots at 20 cart-loads per acre (cart-load=1,120 lbs.) about one month before sowing and well mixed into the soil. Castor-cake was applied in two equal dressings a week before planting and about 4 months after planting. The full rate of application being 40 mds. to the acre.

*Sowings.*—Six sowings were arranged at monthly intervals starting from the middle of November 1932. Variety used was Co. 213.

With the exception of plots for November and December sowings, which were trenched just about a week before planting, all other plots were trenched 4' apart in the middle of Bahmon 1342 F. (December 1932). The trenches were dressed and shaped before each sowing.

Planting was done on due dates by burying sets and about 2" deep end to end in the middle of the trenches and irrigating soon afterwards.

*Germination and growth.*—Germination was fair in all sowings; better in chalka plots than in Regur. Gap fillings were done from one month to two months after planting in different sowings.

The general growth in chalka soil was better than in Regur.

*Weedings and hoeings.*—Thirteen hoeings in early sown plots and 10 in the late sown plots were done. These also included 9 and 6 weedings respectively. Earthing was done twice in all the plots once in the beginning of the monsoon and second time in the middle of Dai 1343 F. (November 1933).

*Irrigations.*—Sixteen irrigations were necessary for November sowings, and 8 for April sowings. The intermediate months had 14, 12, 11, and 9 irrigations respectively. This has been in addition to about 50 inches of rain.

*Pests and diseases.*—Whip smut was noticed. Striga was a general parasite. Stem-borer was also observed in early stages of the growth of the cane. The damage done, however, has not been worth considering.

*Harvest and yields.*—Flowering started in all plots towards the end of Azur 1343 F. (October 1933). Flowering was more regular in chalka plots as compared to Regur plots. Harvesting was started on the 25th Isfindar 1343 F. (27th January 1934) with the November sown crops, and was continued until the April sown crops were finished on the 24th Farwardi 1343 F. (25th February 1934).

The following statement shows the average yields calculated in lbs. per acre:—

Date of sowing	No. of irrigations	Amount of rainfall	No. of diggings and hoeings	Date of harvest	YIELDS IN LBS. PER ACRE			
					Chalka		Regur	
					Stripped cane	Gur	Stripped cane	Gur
15th November 1932 ..	16	51.20"	13	27th to 31st January 1934.	82,100	9,930	29,240	3,080
15th December 1932. ..	14	51.20"	13	1st to 7th February 1934.	72,260	7,593	20,490	2,006
15th January 1933 ..	12	51.20"	13	8th to 11th February 1934.	64,616	7,020	24,046	2,440
15th February 1933 ..	11	50.96"	12	11th to 18th February 1934.	76,173	7,936	30,326	3,136
15th March 1933 ..	9	49.87"	10	19th to 22nd February 1934.	77,833	8,303	30,246	3,733
15th April 1933 .	8	49.16"	11	23rd to 25th February 1934	59,716	6,048	19,500	2,033

NOTE.—As a result of the tentative experiment carried out during the year 1340-1341 Fasli on the small experimental Farm at Nizamsagar, the sowings during the six months from May to October were not done; because the crops out of these sowings ripened in the Winter of the following year only; and therefore though the crop kept on the field for more than 14 months in each case, no gain in the ripening season was achieved.

EXPERIMENT No. 4.—*Comparison of Kharif jowar varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Soil.*—Chalka.

*Preparatory tillage.*—Three ploughings, 2 harrowings, and twice working of Patha were done from the middle of Thir 1342 F. (May 1933) to the middle of Amerdad 1342 F. (June 1933).

*Area and plotting.*—Forty-four plots of less than a guntha each in area were laid out in an acre field to allow of 4 replications for each of the eleven varieties. Each plot measured 825 sq. ft. in area. Plots were separated from each other by small foot-paths located between.

*Manuring.*—Farm-yard manure at 20 cart-loads (one cart-load is equal to 1,120 lbs.) per acre was applied a day previous to sowing.

*Sowing.*—Seed treated with sulphur powder was sown in rows  $1\frac{1}{2}$ ' apart behind the cultivator on the 18th Amerdad 1342 F. (23rd June 1933). Seed rate used was 20 lbs. per acre.

*Germination and growth.*—Germination was good. Thinning was done twice, first on the 10th Shahrewar 1342 F. (16th July 1933), and the second on the 31st Shahrewar 1342 F. (6th August 1933).

Growth was not good. The crops in the field exhibited a patchy appearance, doubtless due to the effects of the scraping of field for levelling.

*Weeding and interculture.*—Four hoeings were done which also included weedings.

*Irrigations.*—No irrigations were done. The crop received 35.18" of rain.

*Pests and diseases.*—Nothing very serious.

*Harvesting and yields.*—The growth was not good. Harvesting was done on the 3rd Bahmon 1343 F. (6th December 1933).

The statement showing the yields follows:—

Serial No.	Name of variety	AVERAGE YIELDS IN LBS. PER ACRE			
		1341-1342 F.		1342-1343 F.	
		Grain	Straw	Grain	Straw
1	Aishpuri ..	122	3,312	122	2,653
2	Californian Dwarf ..	79	2,299	20	646
3	Cawnpore Dodania ..	92	2,676	11	544
4	Gadgiri .. ..	109	3,993	91	2,644
5	Ilaspuri .. ..	160	2,753	73	1,333
6	Kudal Dani .. ..	113	3,055	21	752
7	Local, white .. ..	..	2,902	14	765
8	Local, yellow .. ..	131	4,001	49	1,596
9	Pocha Junna .. ..	112	3,312	26	1,053
10	Ramkhel .. ..	155	2,057	92	3,010
11	Saoner .. ..	141	3,614	107	3,273

EXPERIMENT NO. 5.—*Comparison of Bajra varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Soil.*—Chalka.

*Preparatory tillage.*—One ploughing with heavy inverting plough was done in a freshly levelled field in the middle of Thir 1342 F. (May 1933). Twice harrowing and once working of Patha was done afterwards to get the seed bed ready.

*Area and plotting.*—Twenty-eight plots of  $\frac{1}{33}$  acre in area were prepared in an acre field separated from each other by small footpaths left between. Four replications of the seven varieties were arranged.

*Manuring.*—No manure was given.

*Sowing.*—Sown on the 17th Amerdad 1342 F. (22nd June 1933) in lines 1' apart by dropping seed behind the cultivator at 10 lbs. per acre. Gap filling was done on the 29th Amerdad 1342 F. (4th July 1933).

*Germination and growth.*—Germination was fairly good. First thinning was resorted to on the 7th Shahrewar 1342 F. (13th July 1933); and the second on the 28th Shahrewar 1342 F. (3rd August 1933). Subsequent growth was not good, perhaps owing to the excess of moisture in the fields due to incessant rains; also the after effect of scraping the land for levelling.

Cawnpore awned, and Behar bajras flowered 37 days after sowing, Kambo after 46 days, and all other varieties after 50 days. The growth of all varieties was very uneven from plot to plot.

*Irrigations.*—No waterings were done. The total rainfall during the period the crop was in the field amounted to 31.43" for Behar, Local, and Cawnpore awned varieties, and 32.75" for all others.

*Pests and diseases.*—Nothing very serious. Untimely heavy rains at flowering time impaired the process of fertilisation.

*Harvesting and yields.*—Behar, Cawnpore, and Local varieties were the first to mature, and were harvested on the 5th Azur 1343 F. (10th October 1933). Others matured later and were harvested on 25th Azur 1343 F. (30th October 1933).

Statement showing the average yields calculated in lbs. per acre follows:—

Name of variety	AVERAGE YIELD IN LBS. PER ACRE			
	1341-1342 F.		1342-1343 F.	
	Grain	Straw	Grain	Straw
Akola .. ..	264	462	214	1,010
Akola 14 B .. ..	363	850	334	1,691
Akola 32 C .. ..	280	684	409	2,294
Behar .. ..	218	379	133	1,023
Cawnpore Awned .. ..	295	685	290	1,853
Kambo .. ..	227	610	303	1,568
Local .. ..	289	470	146	957

## EXPERIMENT No. 6.—*Comparison of ground-nut varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Soil.*—Chalka.

*Preparatory tillage.*—Two ploughing with heavy inverting plough followed by two harrowings were done from the middle of Thir 1342 F. (May 1933) to the middle of Amerdad 1342 F. (June 1933).

*Area and plotting.*—Sixteen plots of  $1/18$  acre each in area were marked out in an acre plot separated from each other by well marked interspaces. This was done with the object of allowing 4 replications to the 4 varieties.

*Manuring.*—No manure was given.

*Sowing.*—The nuts were decorticated and the kernels were dropped in furrows behind the cultivator in rows  $1\frac{1}{2}'$  apart on the 14th Amerdad 1342 (19th June 1933). Seedrate used was 50 lbs. of kernels per acre.

*Germination and growth.*—Germination was good in all varieties excepting Spanish pea-nut in which 10 per cent. gap filling had to be done. Gaps were filled in all varieties on the 24th Amerdad 1342 F. (29th June 1933). Growth was good though not uniform owing to the soil of the plot having been disturbed in levelling. Flowering started in all varieties within a month after sowing.

*Weedings and interculture.*—Three hoeings and one weeding were done.

*Irrigations.*—No irrigations were done to help in the growth of the crop. One irrigation, however, was done to the late ripening varieties (Kanki, Hebbal, and Madagaskar) to facilitate uprooting, as the land was very dry at the time.

Total rainfall received by Spanish pea-nut crop amounted to 33.48" while the other varieties received 34.20".

*Pests and diseases.*—Slight attack of cut worms in early stages. Slight affection of Tikka disease in later stages. Crows and wild pigs did also some damage.

*Harvesting and yields.*—Spanish pea-nut No. 5 was the first to mature, and was uprooted on the 12th Azur 1343 F. (17th October 1933). Kanki No. 17 and Hebbal No. 1 were harvested on the 27th and 28th Azur 1343 F. (1st and 2nd November 1933) respectively. Madagaskar was collected on the 3rd Dai 1343 F. (7th November 1933).

The following statement shows the average yields calculated in lbs. per acre:—

Name of Variety	Average yields in lbs. per acre	
	1341-1342 F.	1342-1343 F.
Hebbal No. 1 .. ..	1,066	1,814
Kanki No. 17 .. ..	1,152	2,093
Madagaskar .. ..	1,381	2,043
Spanish Peanut No. 5 ..	918	1,593

EXPERIMENT NO. 7.—*Comparison of Arhar varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Preparatory tillage.*—One deep ploughing followed by a harrowing and running of Patha were done in the first week of Amerdad 1342 F. (June 1933).

*Area and plotting.*—Forty plots of less than a guntha each in area were located in an acre field to allow of 4 replications for the ten varieties. The plots were separated by interspaces left between.

*Manuring.*—No manure was given.

*Sowing.*—The seeds were dibbled one foot-apart in lines 3' apart on the 18th Amerdad 1342 F. (23rd June 1933).

*Germination and growth.*—Germination was fairly good in the varieties. Gap filling was done on the 3rd Shehrewar 1342 F. (9th July 1933). Final thinning of the plants to one per hill was done on the 1st Mehir 1343 F. (7th August 1933). Growth was not uniform. The field showed signs of water logging due to excessive rains.

*Weeding and interculture.*—Three hoeings and one weeding were done altogether.

*Irrigations.*—No watering was done. Rainfall during the period of the growth of crop amounted to 35.21" for Unao Early and 36.43" for all other varieties.

*Pests and diseases.*—Nothing very serious. Blister beetles were noticed.

*Harvesting and yields.*—Unao Early was the earliest to ripen and was harvested on the 1st Bahmon 1343 F. (4th December 1933). Next to harvest was the local on the 14th Isfindar 1343 F. (16th January 1934). All others were harvested from 21st to 24th Farwardi 1343 F. (22nd to 25th February 1934).

The following statement shows the yields:—

Serial No.	Name of variety	YIELDS IN LBS. PER ACRE				
		1st Series	2nd Series	3rd Series	4th Series	Averages
1	Cawnpore ..	2,646	151	327	441	891
2	Coimbatore, red.	1,058	756	1,385	403	900
3	Local ..	1,159	1,310	504	1,209	1,045
4	Nagpur ..	1,260	1,058	1,902	907	1,281
5	Nizam ..	88	37	529	617	317
6	Poona, red ..	88	163	478	819	387
7	Pusa A. 2 ..	642	1,134	315	1,688	944
8	Pusa E ..	617	919	1,360	1,360	1,064
9	Pusa T. G. ..	2,495	390	315	2,129	1,332
10	Unao Early ..	277	352	277	907	458

EXPERIMENT NO. 8.—*Comparison of wheat varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Soil.*—Medium, a mixture of chalka and Regur.

*Preparatory tillage.*—The field was fallow in Kharif, and therefore many ploughings and harrowings were done to keep the weeds down. The field was in very good condition of tilth at the time of sowing.

*Area and plotting.*—An acre field was divided into 48 plots measuring  $30' \times 24'$  each. The plots were separated from each other by leaving interspaces between.

*Manuring.*—Castor-cake at 800 lbs. per acre was applied about 3 weeks before sowing.

*Sowing.*—The seed was sown in dry land behind the cultivator in rows one foot apart and covered by working Patha afterwards on the 8th Azar 1343 F. (13th October 1933) and followed by an irrigation on the following day.

*Germination and growth.*—Germination was good in all varieties. Some slight gap filling was done on the 30th Azar 1343 F. (4th November 1933). Growth was good considering the recent scraping of the field for levelling.

*Weedings and interculture.*—Four hoeings were done in all inclusive of weedings.

*Irrigation.*—Three waterings were applied altogether. In addition the rainfall during the period amounted to 4.60".

*Pests and diseases.*—Nothing noteworthy.

*Harvesting and yields.*—Pusa 4, Pusa 111, and Pusa 80/5 were the earliest to ripen, and were harvested on the 23rd Isfindar 1343 F. (25th January 1934). Next to ripen was Cawnpore No. 13 which was harvested on the 27th Isfindar 1343 F. (29th January 1934). (Nagpur wheats AOS) were late in maturity and were harvested on the 6th Farwardi 1343 F. (7th February 1934) excepting A.O. 85 which was harvested on the 16th Farwardi 1343 F. (17th February 1934). Shet Parner, Sharbati, and Banshi were still late and were harvested from 16th to 19th Farwardi 1343 F. (17 to 20th February 1934).

Yields are tabulated in the following statement:—

Serial No.	Name of variety	YIELDS IN LBS. PER ACRE				Average
		1st series	2nd series	3rd series	4th series	
1	A. O. 13 ..	816	544	968	847	798
2	A. O. 85 ..	1,028	605	726	786	786
3	A. O. 88 ..	1,058	847	484	544	726
4	A. O. 90 ..	756	786	1,058	453	763
5	A. O. 115 ..	1,816	907	544	907	793
6	Bansi ..	726	786	559	789	714
7	Cawnpore No. 13	847	484	771	877	744
8	Pusa 4 ..	650	454	559	650	578
9	Pusa 80/5 ..	892	529	650	453	631
10	Pusa 111 ..	363	605	1,331	423	680
11	Sharbati ..	726	907	535	726	748
12	Shet Parner ..	544	544	242	332	415

EXPERIMENT NO. 9.—*Comparison of gram varieties.*

*Object.*—To find out the most profitable variety for the tract.

*Soil.*—Medium, mixed chalka and Regur.

*Preparatory tillage.*—The field was fallow in the previous Kharif season, and therefore many ploughings and harrowings were done to kill the weeds. The field was in a very good condition of tilth at the time of sowing.

*Area and plotting.*—An acre field was divided into 32 plots measuring 45'×24' each. These plots were separated from each other by interspaces left as foot paths between.

*Manuring.*—No manure was given.

*Sowing.*—Seed sown behind the cultivator in rows 1½' apart at 60 lbs. per acre and covered by working the Patha afterwards on the 9th Azur 1343 F. (14th October 1933).

*Germination and growth.*—Germination was good, no gap filling was necessary. Growth satisfactory considering the unevenness of soil fertility as a result of scraping for levelling. The crop in all plots located in the northern portion of the field was poor.

*Weedings and interculture.*—Three hoeings were done inclusive of one weeding.

*Irrigation.*—No watering was done. Rainfall during the growing period of the crop amounted to 4.60".

*Pests and diseases.*—Nothing noteworthy.

*Harvesting and yields.*—The local variety was the earliest to ripen and was harvested on the 27th Isfindar 1343 F. (29th January 1934). All other varieties ripened practically in the same period, and were harvested from 16th to 18th Farwardi 1343 F. (17th to 19th February 1934).

Yields are tabulated in the statement below:—

Serial No.	Name of variety	YIELDS IN LBS. PER ACRE				
		1st Series	2nd Series	3rd Series	4th Series	Average
1	Bengal ..	241	161	141	120	165
2	Cawnpore ..	443	120	80	392	258
3	Local ..	141	362	483	483	363
4	Poona ..	80	120	524	604	332
5	Pusa. 17 ..	342	141	141	141	191
6	Pusa. 25 ..	604	483	564	80	432
7	Pusa. 28 ..	201	211	189	685	471
8	Sabour ..	624	604	544	382	538

EXPERIMENT No. 10.—*Comparison of Rabi jowar varieties.*

*Object.*—To select a profitable variety for the tract.

*Soil.*—Regur.

*Preparatory tillage.*—One deep ploughing followed by Patha, and one harrowing also followed by Patha were done in the first fortnight of Azur 1343 F. (October 1933).

*Area and plotting.*—One acre field was divided into sixteen plots measuring  $1/18$  acre each in area. The plots were well separated by foot-path interspaces between.

*Manuring.*—The field had been green manured with sunn-hemp in previous Kharif season. No other manure was applied.

*Sowing.*—Seed treated with Sulphur powder was sown in rows 2' apart behind the cultivator and covered by working the Patha on the 19th Azur 1343 F. (24th October 1933). A watering was applied two days after sowing to help in germination.

*Germination and growth.*—Germination was good. No gap filling was necessary. Thinning was done on the 18th Dai 1343 F. (22nd November 1933). The plots located in the northern side of the field did not grow good crop because of the effect of scraping the land for levelling.

*Weedings and interculture.*—Two hoeings inclusive of a weeding were done.

*Irrigations.*—Only one watering was applied a couple of days after sowing. Rainfall during the growing period amounted to 3.28" only.

*Pests and diseases.*—Slight attack of stem-borer in early stages.

*Harvesting and yield.*—Harvesting was done from the 8th to 14th Ardibehisht 1343 F. (12th to 18th March 1934).

The yields are tabulated in statement below:—

Serial No.	Name of variety	YIELD IN lbs. PER ACRE				
		1st Series	2nd Series	3rd Series	4th Series	Average
1	Californian Dwarf. ..	81	2	2	25	27
2	Maldandi ..	1,053	81	792	6	482
3	Markhandi ..	679	202	58	5	237
4	Sai Junna ..	603	594	2	58	314

EXPERIMENT NO. 11.—*Planting time tests with irrigated ground-nuts in Rabi season.*

*Object.*—To study the behaviour of ground-nuts as an irrigated crop in Rabi season, and to find out the best time for planting to secure optimum yields.

*Soil.*—Light chalka.

*Preparatory tillage.*—One deep ploughing with an inverting plough followed by 3 harrowings and working of Patha from the end of Azur 1343 F. (October 1933) to the end of Dai 1343 F. (November 1933).

*Area and plotting.*—An acre plot was divided into 4 series. Each series consisted of 3 plots, one for each variety. Each plot was divided into 6 sub-plots, one for each sowing. Thus the dimensions of each sub-plot were 35'×15'.

*Manuring.*—No manure was given.

*Sowing.*—Three varieties, namely, Kanki No. 17, Hebbel No. 1, and Spanish pea-nut No. 5 were used for the experiment. Four sub-plots of each variety were sown fortnightly starting from the 17th December 1933 and ending with the 3rd March 1934. Sowings were done according to the usual method of dropping the seed behind the cultivator in rows 1½' apart and covering by working Patha afterwards.

*Germination and growth.*—Germination was good in all varieties and all sowings. The growth, however, was not vigorous.

*Weedings and interculture.*—One weeding was done in all plots. Five hoeings each to the first three dates of sowings plots, and two to the last sowing plots were done.

*Irrigations.*—From eight to ten irrigations were necessary in all plots.

*Pests and diseases.*—A sort of dung beetle was responsible for a fair amount of damage in all pots.

*Harvesting and yields.*—The uprooting of nuts was done as the crop matured in the various plots. The time taken by the various sowings from sowing to maturity decreased as the season of sowing advanced. The first sowings took 21 weeks to mature, while the last ones took only 15 weeks. Spanish pea-nut variety took a week lesser in each case.

The following statement shows the yields:—

Date of sowings	YIELD IN LBS. PER ACRE		
	Kanki 17	Hebbal 1	Spanish Peanut 5
14-3-1943 F. (17-12-1933) ..	95	260	545
1-4-1943 F. (3-1-1934) ..	110	415	335
14-4-1943 F. (16-1-1934) ..	140	510	350
29-4-1943 F. (31-1-1934) ..	115	370	295
15-5-1943 F. (16-2-1934) ..	135	365	350
30-5-1943 F. (3-3-1934) ..	12	6	365

*Non-experimental crops.*—Some fodder and general crops were grown in fields not occupied by the experiments with the object of finding fodder for the cattle, or general study of behaviour, or ploughing in for green

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manure. The following statement shows the outturns of such crops together with the area under each.

Name of crop		AREA ACTUAL OUTTURN IN lbs.					Remarks
		Acres	Gun- tas	Grain	Fodder		
					Green	Dry	
Berseem	..	..	30	..	9,000	..	Dry chillies.  Kapas.
Castor	..	1	..	404	..	..	
Chillies	..	1	..	..	..	96	
Cotton	..	5	..	512	..	..	
Jowar Kharif	.	14	..	..	34,665	..	
Jowar Rabi	..	2	..	..	4,050	..	
Lucerne	..	..	37	..	5,100	..	
Oats	..	..	37	..	1,826	..	
Oats	..	..	3	80	..	..	
Sannhemp	..	2	..	145	..	..	
Sannhemp	..	9	..	Green manured.			
Sesamum	..	1	20	141	..	..	One acre total failure.
Sugar-cane assorted	..	1	..	..	27,663	..	Stripped cane.
Tobacco	..	1	20	..	..	455	dry leaf.

The above statement includes 5 acres of cotton, out of which 3 acres were grown with general propagation,—Strains and 2 acres were used by the Cotton Research Botanist for experimental work.

The castor crop consisted of many strains of castor supplied by the Economist Botanist.

*Permanent improvements.*—Levelling of the fields continued throughout the year. The areas lying on the eastern side of the road are being put in order for cultivation. Tree planting on the road sides has been done. The premises of the office and the residential quarters have been cleared up.

*Cattle.*—Out of the ten pairs of cattle on the farm, eight are in good order. The other two pairs have grown old and arrangements for replacing them are under consideration. The cattle withstood the heavy work on the farm in a remarkable manner.

*Manure pits.*—Proper manure pits have been dug and put in use. Compost is being prepared in accordance with the Indore method.

*Buildings.*—The following buildings were handed over by the P.W.D. during the year under review:—

1. Farm Superintendent's quarters.
2. Assistant Superintendent's quarters.
3. Office.
4. Rat proof store.
5. Threshing floors.
6. Menials' quarters 10.

The bullock-shed and watering trough were under construction at the end of the year.

*Implements.*—Most of the implements for the farm had been purchased during the previous years. A few more were purchased according to necessity during the year. The following is a list of more important ones:—

1. Road scrapers	..	..	4
2. Cole's combination cotton and corn planter	..	..	1
3. Water cart	..	..	1
4. Farm cart	..	..	1
5. Sporting gun 12-bore	..	..	1
6. Thermometer for gur boiling	..	..	1
7. Sets of modified McGlashan's pans.			3
8. Tarpaulins	..	..	2
9. Gas lamps	..	..	2
10. Gur moulds	..	..	50
11. Stencils	..	..	1 set.
12. Gur cooling pans	..	..	8

Many other parts of the implements were purchased to replace the worn-out ones.

*Finances.*—Total expenditure during the year under review amounted to Rs. 11,987-11-2, and the farm income totalled Rs. 2,046-12-1.

*Farm demonstration.*—An Agricultural Demonstration was held on the Farm on the 5th Farwardi 1343 F. (6th February 1933). Crowds of cultivator class collected from all over the district. The Revenue officials took keen interest in bringing the cultivators to the show.

Sugar-cane crop from sowing to gur making was the chief item of demonstration. Horticultural, Botanical and Entomological sections were also represented.

The visitors took keen interest in the show. The number of visitors was estimated to be over 5,000 souls.

*Charge and establishment.*—Mr. Syed Hashmatulla, held charge of the farm throughout the year with the exception of about 5 weeks (from 3rd Azar to 7th Dai 1343 F.) when he availed of sick leave. Mr. Ehsan Hussain, Assistant Farm Superintendent, officiated for him during that period.

Mr. Ehsan Hussain, availed of two months' leave with effect from 21st Dai 1343 F. and was transferred during this period from the farm, his place having been taken over by Mr. Abdur Rahim Mian with effect from 9th Bahmon 1343 F.

Though a lot of work has been accomplished during the year in shaping the farm, still a lot remains to be undertaken. The staff has no doubt experienced some arduous times in achieving the aim, but the cause is noble and credit is surely due to Mr. Syed Hashmatullah for the display of untiring energy in development.

A. SOOFEE,

15-5-1344 F.

*Deputy Director of Agriculture,*

*Western Telingana Division,*

*Himayatsagar,*

*Hyderabad-Deccan.*

Statement showing the record of rainfall at the Agricultural Experimental Farm, Rudroor,  
for the year 1342-43 Faslî.

RAINFALL IN INCHES												
Date	Amer- dad	Shah- rewar	Mehir	Aban	Azur	Dai	Bah- mon	Isfan- dar	Far- wardi	Arde- behisht	Khur- dad	Thir
1	..	0.06	..	0.29	..	..	..	..	..	..	..	..
2	0.04	0.43	..	1.29	..	..	..	..	..	..	0.24	..
3	0.23	..	0.06	0.30	..	..	..	..	..	..	..	..
4	1.05	..	1.99	0.63	..	..	..	..	..	0.18	..	..
5	0.13	1.29	1.29	0.73	..	..	..	..	..	..	..	..
6	1.51	0.53	0.44	3.92	..	..	..	..	..	..	..	..
7	0.19	0.05	..	0.33	..	..	..	..	..	..	..	..
8	0.25	0.67	..	0.56	..	..	..	..	..	..	..	..
9	1.02	0.69	0.09	0.02	0.02	..	..	..	..	..	..	..
10	0.91	0.43	..	..	..	..	..	..	..	..	..	..
11	1.15	0.07	..	0.04	..	..	..	..	..	..	..	..
12	0.25	0.07	..	..	0.58	..	..	..	..	..	..	..
13	..	..	..	0.05	0.04	..	..	..	..	..	..	..
14	0.47	..	0.06	1.61	0.11	..	0.02	..	..	..	0.56	..
15	0.85	..	0.08	..	0.52	0.23	..	..	..	..	..	..
16	..	..	0.57	..	..	0.01	0.03	..	..	..	0.10	..
17	..	..	0.09	..	0.05	..	..	..	..	..	..	..
18	..	..	0.78	..	..	..	0.03	..	..	..	..	..
19	..	..	0.06	..	..	0.09	..	..	..	..	..	..
20	0.03	0.87	..	..	..	1.73	0.22	..	..	..	..	..
21	0.46	0.39	0.28	..	..	..	0.92	..	..	..	..	..
22	1.09	1.05	1.33	..	..	..	..	..	..	..	..	..
23	1.24	0.58	..	..	..	..	..	..	..	..	..	..
24	0.90	0.15	..	..	..	..	..	..	..	..	..	..
25	0.10	0.68	..	0.11	..	..	..	..	..	..	..	..
26	0.16	0.89	0.07	..	..	..	..	..	..	..	..	..
27	..	0.36	0.67	0.01	..	..	..	..	..	..	..	..
28	..	0.08	..	..	..	..	..	..	..	..	..	..
29	..	0.50	..	..	..	..	..	..	..	..	..	..
30	..	0.40	0.36	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..
Total	12.03	9.74	8.22	9.89	1.32	2.06	1.22	..	..	0.18	0.90	..

Grand total for the whole year is 45.56".

*Agricultural Experimental Farm, Rudroor.*

The Programme of Research and Experimental work to be carried out for the year 1343-44 F., is as follows:—

1. Sugar-cane manurial tests.
2. Comparison of sugar-cane varieties.
3. The sugar-cane planting time experiment.
4. Comparison of Kharif jowar varieties.
5. Comparison of bajra varieties.
6. Comparison of ground-nut varieties.
7. Comparison of arhar varieties.
8. Comparison of wheat varieties.
9. Comparison of gram varieties.
10. Comparison of Rabi jowar varieties.
11. Planting time tests with irrigated ground-nuts in Rabi season.

*Annual Report of the Government Demonstration Farm,  
Mahboobnagar, for the year 1342-43 Fashl.*

*Introduction.*—The lands for this farm were acquired in 1334 F., and cultural operations were started the following year. The area was mostly uneven, and considerable amount of levelling with road scrapers had to be resorted to in order to make the fields fit for cropping. Proper experimental work, however, could not be undertaken until 1338 F.

*Situation.*—The farm is situated on the eastern side of Mahbubnagar town on the southern side of the highroad from Hyderabad to Kistna between the 62nd and 63rd mile. The railway station is about half a mile away. There are two travellers' bungalows situated very near the farm on the north-east. The new building of the Taluqdar's (Collector's) office is being constructed opposite the farm gate.

*Object.*—The farm is maintained to serve as a demonstration farm for the district of Mahbubnagar, and to test and illustrate the crops, fertilisers, and implements which have proved or seem likely to suit the general conditions of the district.

*Soil.*—Major portion of the farm consists of light chalka soil. There is, however, an area of 8 acres consisting of medium regur (black-soil). Certain patches of alkaline soil are also to be found which affect an area of more or less 10 acres in extent.

*Area.*—Total area of the farm amounts to 76 acres, of which about 60 acres are cultivable. The rest of the area is uncultivable waste consisting of high lying boulders, and low lying depressions.

*Source of Irrigation.*—Two good wells are fitted with pumps in addition to mhots, and supply of water for irrigation.

*Season.*—The total rainfall during the year under review recorded on the farm amounted to 34.63". The distribution of the rains early in the season was even and uniform with the result that the crops continued

growing uniformly. The exceptionally heavy down-pours late in the season 6.45" in 3 consecutive days in Azur 1343 F., (October 1933) were responsible for flooding the farm area. Considerable farm area was inundated and about 30 acres were totally submerged. Most of this area was reserved for Rabi sowings, and the rabi crops were badly damaged owing to the water stagnating in the fields.

*Experimental cropping.*—The results of the experiments conducted on the farm during the year under review are given in the following pages.

#### EXPERIMENT NO. 1.—*Manurial Experiment with Nicifos on Paddy.*

*Object.*—To find out if Nicifos is more profitable a fertiliser for paddy than a combination of Ammonium Sulphate and Superphosphate.

*Soil.*—Typical paddy soil.

*Plotting.*—The experiment is carried out in duplicate plots measuring 1 guntha each (40 gunthas=1 acre). There are six plots altogether separated from one another by strong thick bunds.

*Treatment.*—The following different treatments are applied to the respective plots each season:—

- (a) Farm-yard manure alone at 4,000 lbs. per acre.
- (b) Farm-yard manure at 4,000 lbs. per acre plus Ammonium Sulphate at 100 lbs. per acre plus Superphosphate at 125 lbs. per acre.
- (c) Farm-yard manure at 4,000 lbs. per acre plus Nicifos (18/22 grade) at 100 lbs per acre.

*Manuring.*—The farm-yard manure was applied in full a fortnight before the transplanting of seedlings and was well mixed in the soil.

Ammonium Sulphate was applied in two equal dressings, first a fortnight after transplanting and the second three weeks after the application of the first dressing.

Superphosphate was applied in full at the time of last puddling.

Nicifos was also applied at the time of the last puddling.

*Sowing.*—Single seedlings of Nizamgoad variety were transplanted at a distance of 6"×4" on the 29th Shahrewar 1342 F. (4th August 1933).

*Weedings and Interculture.*—One hand weeding was done on the 26th Mehri 1342 F. (1st September 1933). The plots got submerged with rain water flooding before the second weeding could be undertaken. and therefore the weeding had to be abandoned.

*Growth.*—Stand of the crop was good in all plots.

*Pests and Diseases.*—Grasshoppers were responsible for some damage in Abi crop.

*Harvesting.*—The crop was collected on the 21st Dai 1343 F. (25th November 1933).

The same plots with the same treatments were also used for Tabi crops.

The results are tabulated in the following statement.

Treatment	AVERAGE YIELD CALCULATED IN LBS. PER ACRE							
	A b i				T a b i			
	1341-1342 F.		1342-1343 F.		1341-1342 F.		1342-1343 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
Farmyard Manure alone ..	4,250	11,700	3,940	4,950	2,005	4,040	1,410	1,750
Farmyard Manure plus Ammonium Sulphate plus Superphosphate .	3,950	12,770	5,100	10,100	2,050	3,880	738	1,500
Farmyard Manure plus Nicifos ..	4,550	10,790	7,840	5,150	2,300	4,420	1,690	2,800

The above results are decidedly in favour of Nicifos application.

EXPERIMENT No. 2.—*Ploughing Experiment with paddy.*

*Object.*—To demonstrate the value of ploughing up the land after harvest of the previous crop with improved plough instead of leaving it uncultivated until the sowing season.

*Soil.*—Typical paddy soil.

*Treatments.*—The following treatments were compared.

1. Land left unploughed after harvest of the previous paddy crop.
2. Land ploughed with country plough immediately after the harvest of the previous paddy crop.
3. Land ploughed with iron plough (Monsoon) immediately after the harvest of the previous paddy crop.

*Plotting.*—Duplicate plots of 1 guntha each (1/40 acre) were placed under each of the above-mentioned treatments.

*Preparatory tillage.*—For Abi (Kharif) crop ploughing was done on the 10th Tir 1342 F. (15th May 1933) immediately after the removal of the previous Tabi crop. For Tabi the ploughings were carried out on the 26th Dai 1343 F. (30th November 1933) after the harvest of Abi crop.

*Sowings.*—Single seedlings of Nizamgoad paddy were transplanted 6"×4" apart on the 29th Shahrewar 1342 F. (4th August 1933). In Tabi season the seedlings of Paddy No. 504 were transplanted instead of Nizamgoad on the 21st Isfandar 1343 F. (23rd January 1934).

*Weedings and Interculture.*—One hand weeding was done each for Abi and Tabi crop.

*Growth.*—The crops grew well in Abi season but in Tabi the growth was rather stunted.

*Pests and Diseases.*—Some grasshoppers did a slight damage to Abi crops. Hispa was rather more vigorous in Tabi season and damaged the crop to a fair extent before it could be brought under control.

The experiment was originally started in the Abi season of 1338-1339 F. (1929) with Nizamgoad paddy and has been continued in the same plots since. During the year under review Paddy No. 504 has been introduced in the experiment instead of Nizamgoad with effect from the Tabi sowings.

The results are tabulated below:—

### ABI SEASONS.

Treatment	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE									
	1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Unploughed ..	5,080	5,020	3,760	11,800	4,800	9,920	4,720	9,500	5,000	6,200
2. Ploughed with country plough ..	5,560	5,680	4,360	10,000	4,360	10,900	4,440	8,040	4,800	6,000
3. Ploughed with monsoon plough ..	5,920	6,040	4,760	12,400	4,440	11,600	4,120	8,060	6,420	5,000

### TABI SEASONS.

Treatment	AVERAGE YIELDS CALCULATED IN LBS. PER ACRE									
	1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Unploughed ..	2,480	7,420	3,920	6,900	4,280	7,280	1,680	3,240	340	800
2. Ploughed with country plough ..	2,920	6,880	4,080	6,660	3,760	6,640	2,760	4,400	760	1,600
3. Ploughed with monsoon plough ..	4,080	6,660	4,840	4,000	4,340	6,240	1,740	4,000	190	700

The tabi crop during the year under review was more or less a failure owing to the effect of the submer-sion of plots due to floods.

### EXPERIMENT NO. 3.—*Comparison of Kharif Jowar varieties.*

*Object.*—Selection of the most profitable variety for cultivation in Mahbubnagar district.

*Soil.*—Light chalka.

*Preparatory tillage.*—Two ploughings with Victory plough each followed by a harrowing were done on the 16th Thir 1342 F. (21st May 1933), and 2nd Amerdad 1342 F. (7th June 1933) respectively.

*Plotting.*—44 plots of one guntha ( $1/40$ th acre) each in area were prepared to allow of 4 replications of each variety. Plots were separated from each other by fair sized strips left between.

*Manuring.*—Town sweepings at 30 cartloads per acre (cartload is equal to 600 lbs.) were applied on the 11th Amerdad 1342 F. (16th June 1933).

*Sowing.*—The sulphur treated seeds of all the varieties were hand dibbled 9" apart in rows 18" apart in their respective plots on the 17th Amerdad 1342 F. (22nd June 1933).

*Germination and growth.*—The germination was satisfactory in all varieties excepting Saoner. Gap filling was done eight days after sowing. Thinning of plants to one per hill was done on the 31st Shahrewar 1342 F. (6th August 1933). Growth was good helped by the timely rains. Some of the tall varieties lodged towards the end of the season due to the exceptionally heavy downpours and high winds.

*Weedings and Interculture.*—One hand weeding and hoeing were done in all plots. Some of the very weedy plots were given additional hand weedings.

*Rainfall and Irrigations.*—No irrigation was given. Total rainfall during the period the crop was in the field amounted to 26.13".

*Pests and Diseases.*—Nothing noteworthy.

*Harvesting.*—The varieties were harvested in the order of their ripening. Californian Dwarf was the earliest to ripen and harvested on the 16th Aban 1342 F. (21st September 1933). Local white, local yellow, Kodai Dani, Cawnpore Dodania, Aishpuri, Ilaspuri, and Pocha Junna were harvested on the 27th Azar 1343 F. (1st November 1933). Gadgiri and Saoner were the latest varieties and were reaped on the 12th Dai 1343 F. (16th November 1933).

The average height of the varieties varied a good deal. Californian Dwarf grew to the height of 5' only; Local white and local yellow grew 7' high, Cawnpore Dodania and Ilaspuri 10' each, Aishpuri 11', and all others 12' and over.

*Yields.*—The yields are tabulated in the following statement.—

Name of variety	AVERAGE YIELD IN lbs. PER ACRE									
	1938-1939 F.		1939-1940 F.		1940-1941 F.		1941-1942 F.		1942-1943 F.	
	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Aishpuri .	..	..	..	..	3,160	17,680	115	13,810	1,970	7,190
2. Californian Dwarf	1,970	4,500	552	6,136	330	8,650	Failure	Failure	1,693	5,610
3. Cawnpore Dodania .	3,040	10,195	650	7,008	1,378	15,320	180	5,950	2,140	6,790
4. Gadgiri ..	..	..	1,264	17,800	1,502	23,520	185	12,770	1,750	8,730
5. Ilaspuri .	2,570	12,000	888	10,896	1,766	22,910	225	20,270	1,820	7,730
6. Kodal-dani ..	..	..	760	4,480	2,495	15,650	120	6,060	1,775	6,330
7. Local white ..	1,930	8,760	..	..	..	..	115	10,010	2,210	8,430
8. Local yellow ..	1,830	11,125	1,512	5,256	2,659	10,650	250	11,000	2,230	9,370
9. Pocha Junna ..	1,480	7,400	552	2,520	1,615	12,095	730	9,630	2,020	6,770
10. Ramkhel ..	..	..	..	..	2,655	23,680	165	13,260	1,950	5,550
11. Saoner .	2,040	11,250	400	10,016	1,711	22,675	145	12,440	860	8,550

NOTE.—Gidgap variety was discarded for being late and producing very little of grain. It was not therefore included in the experiments during the year under review.

#### EXPERIMENT No. 4.—*Comparison of Bajra varieties.*

*Object.*—To select the most profitable variety for cultivation in Mahbubnagar district.

*Soil.*—Light chalka.

*Plotting.*—28 plots of guntha (1/40th acre) each in field was done during the previous fallow season. One ploughing and one harrowing was done before sowing.

*Plotting.*—28 plots of guntha (1/40th acre) each in area were prepared separated from each other by fair sized strips left between.

*Manuring.*—Owing to the recent heavy scraping of soil for levelling manuring in the form of application of 33 cartloads (cartload is equal to 600 lbs.) of town sweeping per acre was done.

*Sowings.*—The seeds of all varieties were hand dibbled in rows 18" apart in their respective plots on the 3rd Mehir 1342 F. (9th August 1933). Germination was good in all plots. Thinning of the plants from 6" to 9" apart was done on the 19th Mehir 1342 F. (25th August 1933).

*Weedings and Interculture.*—One weeding and one hoeing with cultivator were done.

*Rainfall and Irrigations.*—No irrigation was done. The rainfall during the period the crop was in the field amounted to 15.22".

*Pests and Diseases.*—Nothing noteworthy.

*Harvesting.*—Behar and Cawnpore varieties were the earliest to ripen and were harvested on the 29th Azur 1343 F. (3rd November 1933). Kambo and Akola varieties were the next to ripen and harvest in the first week of Dai 1343 F. Local variety was the latest of all and was reaped on the 15th Dai 1343 F. (19th November 1933).

*Yields.*—The statement showing the average yields calculated in lbs. per acre.

				AVERAGE YIELD IN LBS. PER ACRE							
				1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.	
		Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. Akola	..	1,280	3,333	..	..	1,315	4,200	1,517	5,150	1,225	4,800
2. Akola 14 B.	..	..	..	..	..	1,400	4,750	162	4,250	1,285	5,200
3. Akola 32 C.	..	..	..	..	..	1,460	5,550	255	5,450	1,110	4,890
4. Behar	..	..	..	..	..	1,430	4,600	1,295	4,870	1,450	4,840
5. Cawnpore Awned		1,351	2,800	907	3,632	1,500	4,050	1,430	4,550	1,425	4,900
6. Kambo	..	..	..	..	..	..	..	58	2,800	1,040	4,300
7. Local	..	1,387	3,488	..	..	1,340	6,800	95	6370	1,075	4,450

Behar and Cawnpore varieties have given the highest yields during the year under review.

# EXPERIMENT NO. 5.—*Comparison of Ground-nut varieties.*

*Object.*—To select the most profitable variety for cultivation in Mahbubnagar district.

*Soil.*—Light chalka.

*Preparatory tillage.*—Two ploughings each followed by a harrowing were done on 3rd Amerdad 1342 F. (8th June 1933), and 12th Amerdad 1342 F. (17th June 1933) respectively.

*Plotting.*—28 plots one guntha ( $1/40$ th acre) each in area were prepared to allow of four replications for each variety.

*Manuring.*—No manure was given.

*Sowings.*—Seeds of the various varieties were hand dibbled in their respective plots 9" apart in rows 12" apart on the 14th Amerdad 1342 F. (19th June 1933). Germination was good, but owing to a spell of dry weather just after the seedlings of some varieties were affected, more especially those of Akola No. 10. Gap filling was done wherever necessary.

*Weedings and Interculture.*—Two weedings and two hoeings were done.

Rainfall in the growing period amounted to 26.44".

*Pests and Diseases.*—Nothing noteworthy. Tikka disease was observed on the leaves of practically all the varieties towards the ripening period of the crop.

*Harvesting.*—The early varieties consisting of small nuts were dug out on the 21st Azur 1343 F. (26th October 1933), and the late varieties on the 15th Dai 1343 F. (19th November 1933).

*Yields.*—The following statement shows the average yields calculated in lbs. per acre.

Name of variety	AVERAGE YIELD OF DRY NUTS IN lbs. PER ACRE				
	1338-1339 F.	1339-1340 F.	1340-1341 F.	1341-1342 F.	1342-1343 F.
1. Akola No. 10 ..	..	..	..	..	2,180
2. Hebbal No. 1 ..	..	..	3,027	3,030	2,270
3. Kanki No. 17 ..	2,360	3,886	3,360	2,670	2,510
4. Madagaskar ..	..	..	..	2,630	1,880
5. Small Japan ..	..	..	3,040	2,930	1,930
6. Spanish Peanut No. 5 ..	2,270	3,200	2,800	3,490	1,190
7. Spanish Peanut No. 9 ..	..	..	2,407	3,210	1,280

EXPERIMENT No. 6.—*Comparison of Arhar varieties.*

*Object.*—To select the most profitable variety suitable for local conditions.

*Soil.*—Chalka.

*Preparatory tillage.*—One deep ploughing followed by a harrowing was done.

*Plotting.*—Forty plots of one guntha ( $1/40$ th acre) each in area were prepared to allow of four replications for the varieties.

*Manuring.*—No manure was applied.

*Sowing.*—The seeds of the various varieties were dibbled in their respective plots at a distance of  $3' \times 3'$  on the 8th Amerdad 1342 F. (13th June 1933). Germination was good. Thinning of the plants was done on the 31st Shehrewar 1342 F. (6th August 1933) and only one plant per hill was left.

*Weedings and Interculture.*—3 weedings and 3 hoeings were done, because of the field being badly infested with weeds.

*Rainfall and Irrigation.*—No irrigation was done. Total rainfall received by the crop in the field amounted to 27.73" for Unao Early, and 30.18" for all other varieties. The distribution of the rain was good and proved beneficial to the crop.

*Pests and Diseases.*—Nothing noteworthy.

*Harvesting.*—Unao Early was the earliest to ripen and was harvested on the 16th Azur 1343 F. (21st October 1933). Coimbatore Red, and Pusa E were harvested on the 26th Bahman 1343 F. (29th December 1933). Poona Red, and Local were the next to be harvested on 4th Isfindar 1343 F. (6th January 1934). Nizam Tur was harvested on the 10th Isfindar 1343 F. (12th January 1934). Pusa A-2, and Pusa T.G. were collected on the 18th Farwardi 1343 F. (19th February 1934). Cawnpore variety was harvested on the 22nd Farwardi 1343 F. (23rd February 1934). Nagpur variety was the latest of all and was harvested on the 4th Ardibehisht 1343 F. (8th March 1934).

*Yields.*—The following statement shows the average yields calculated in lbs. per acre.

Serial No.	Name of variety	AVERAGE YIELD OF GRAIN IN lbs. PER ACRE			
		1339-1340 F.	1340-1341 F.	1341-1342 F.	1342-1343 F.
1	Cawnpore ..	1,447	327	1,600	1,000
2	Coimbatore red ..	..	..	1,912	1,730
3	Local ..	1,536	1,070	1,725	1,440
4	Nagpur ..	..	702	1,680	658
5	Nizam Tur ..	..	..	685	990
6	Poona Red ..	..	500	1,885	1,110
7	Pusa A2. ..	..	150	1,610	720
8	Pusa E. ..	..	100	1,805	1,380
9	Pusa T. G. ..	..	..	1,920	860
10	Unao early ..	..	..	370	955

EXPERIMENT NO. 7.—*Comparison of Kharif Cotton varieties.*

*Object.*—To investigate the possibilities of cotton cultivation in Mahbubnagar district, and to find out the most profitable variety.

*Soil.*—Heavy chalka.

*Preparatory tillage.*—Three ploughings with Victory plough each followed by a harrowing were done during the month of Amerdad and early Shahrewar 1342 F. (June and July 1933).

*Plotting.*—20 plots of 1 guntha ( $1/40$ th acre) each in area were laid out to allow of 4 replications of five varieties.

*Manuring.*—No manure was given.

*Sowings.*—Seeds of Western Kumpta varieties were hand dibbled 18" apart and on ridges two feet apart; and those of Gadag and Coimbatore varieties were dibbled 24" apart on ridges 30" apart. Sowing was done on the 4th Mehir 1342 F. (10th August 1933).

*Germination and growth.*—Germination was satisfactory and growth good. All varieties branched profusely.

*Weedings and Interculture.*—Two weedings were done.

*Rainfall and Irrigation.*—Four irrigations in addition to 17.59" of rainfall were given.

*Pests and Diseases.*—Mild attack of boll worm on all the varieties, also jassids.

*Harvesting.*—The following statement shows the yields calculated in lbs. per acre.

Name of variety	AVERAGE YIELD OF SEED COTTON IN lbs. PER ACRE		
	1340-1341 F.	1341-1342 F.	1342-1343 F.
Coimbatore No. 1. ..	..	..	1,310
Coimbatore No. 2. ..	..	..	1,420
Gadag No. 1. ..	1,050	..	1,160
Kumpta .. ..	935	..	1,490
Western .. ..	790	..	1,556

No crop was collected in 1341-1342 F. because of the field having been inundated by flood water, which kept on stagnating for many months and thus totally ruined the crop.

The above results are pretty well in favour of cotton cultivation considering the yields obtained.

#### EXPERIMENT NO. 8.—*Comparison of Wheat varieties.*

*Object.*—To select the most suitable variety for growing in the district.

*Soil.*—Medium Regur (black soil).

*Preparatory tillage.*—Two deep ploughings each followed by a harrowing were done during Aban 1342 F. and Azar 1343 F. (September and October 1933).

*Plotting.*—Forty-eight plots of  $5/8$  guntha ( $1/64$  of an acre) each in area were laid out to allow of 4 replications of the 12 varieties.

*Manuring.*—The field was green manured with sunn hemp, and compost at 20 cartloads (cartload=600 lbs.) per acre was applied in addition.

*Sowings.*—The seeds of the various varieties were drilled one foot apart in rows in their respective plots on the 1st Dai 1343 F. (6th November 1933).

*Germination and growth.*—The germination was not good owing to the excess of moisture in the field. Partial resowings and gap filling were done on the 24th Dai 1343 F. (28th November 1933). Thinning of the plants was done on the 10th Bahman 1343 F. (13th December 1933). Growth was good.

*Weedings and Interculture.*—One weeding and one hoeing were done.

*Pests and Diseases.*—The varieties were attacked by rust in varying degrees.

*Harvesting.*—The varieties were harvested as they ripened. The earliest to ripen was Pusa 4 and was reaped on 24th Farwardi 1343 F. (25th February 1934). Pusa 111, and Sharbati were harvested 3 days later, Cawnpore, and Pusa 80/5 were reaped a week later than Pusa 4.

A.O. 88 was harvested on the 1st Ardibehisht 1343 F. (5th March 1934) while A.O. 13. and A.O. 115 were reaped 2 days later. A.O. 85 and Shet-Parner were harvested on the 11th Ardibehisht 1343 F. (15th March 1934). A.O. 90 was the latest of all varieties and was reaped on the 16th Ardibehisht 1343 F. (20th March 1934).

*Yields.*—The following statement shows the average yields in lbs. per acre.

Name of variety			AVERAGE YIELD IN LBS. PER ACRE									
			1838-1839 F.		1839-1840 F.		1840-1841 F.		1841-1842 F.		1842-1843 F.	
			Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
1. A. O. 13	..	..	..	..	..	..	..	..	..	704	1,728	
2. A. O. 85	..	..	..	..	..	..	..	..	..	584	1,920	
3. A. O. 88	..	..	..	..	..	..	..	..	..	736	2,016	
4. A. O. 90	..	..	..	..	..	..	..	..	..	752	1,424	
5. A. O. 115	..	..	..	..	..	..	..	1,200	1,640	1,032	1,808	
6. Bansi	..	1,220	1,420	1,180	1,660	2,490	2,700	640	880	764	2,288	
7. Cawnpore No. 13.	2,360	2,710	1,360	1,560	2,840	2,920	980	1,420	776	2,312		
8. Pusa 4	..	2,510	2,910	1,470	1,820	2,400	3,040	1,560	1,700	1,160	2,496	
9. Pusa 80/5	..	..	..	..	..	2,150	3,040	110	420	1,600	3,008	
10. Pusa 111	..	..	..	..	..	2,165	2,380	1,240	1,440	1,192	2,352	
11. Sharbati	..	1,170	1,370	1,120	1,760	1,905	3,000	280	720	356	2,368	
12. Shet Parner	..	..	..	..	..	1,900	2,800	1,140	1,600	492	1,584	

#### EXPERIMENT No. 9.—*Comparison of Gram varieties.*

*Object.*—To find out the most profitable variety for the district.

*Soil.*—Medium Regur (black soil).

*Preparatory tillage.*—Two deep ploughings each followed by a harrowing were done in Azur 1343 F. (October 1933).

*Plotting.*—Thirty plots  $5/8$  guntha ( $1/64$ th acre) each in area were laid out in field. This allowed 4 replications for 7 varieties and two only for the eighth.

*Manuring.*—A crop of sunn hemp was grown in the field and green manured.

*Sowings.*—The seeds of the various varieties were drilled 1 foot apart in rows on the 11th Dai 1343 F. (15th November 1933). Gap filling was done on the 2nd Bahman 1343 F. (5th December 1933).

*Germination and growth.*—The germination was not very good owing to partial submersion of the field in the floods. The field had excess of moisture and the growth was affected rather adversely.

*Weedings and Interculture.*—Three weedings and one hoeing were done.

*Pests and Diseases.*—Gram caterpillar appeared but was soon controlled.

*Harvesting and Yields.*—Harvesting was done as the varieties kept on ripening. The earliest to ripen were Poona, and Bengal grams, which were harvested on the 9th Farwardi 1343 F. (10th February 1934). Next came local and Sabour to be reaped on the 25th Farwardi 1343 F. (26th February 1934). Cawnpore, Pusa 25, and Pusa 28 were reaped on the 2nd Ardi-behisht 1343 F. (6th March 1934). Pusa 17 was the latest of all and was collected on the 15th Ardi-behisht 1343 F. (19th March 1934).

*Yields.*—The following statement shows the yields.

Serial No.	Name of variety	AVERAGE YIELD IN lbs. PER ACRE		
		1340-1341 F.	1341-1342 F.	1342-1343 F.
1	Bengal .. ..	..	..	456
2	Cawnpore .. ..	..	..	424
3	Local .. ..	487	..	192
4	Poona .. ..	510	..	448
5	Pusa 17 .. ..	95	..	156
6	Pusa 25 .. ..	10	..	280
7	Pusa 28 .. ..	49	..	276
8	Sabour .. ..	487	..	368

The field growing gram varieties in the year 1341-42 was inundated with flood water which stagnated for many months and thus totally ruined the crop.

Even during the year under review the yields have not been good.

EXPERIMENT No. 10.—*Comparison of Rabi Jowar varieties.*

*Object.*—To select the most profitable variety for the district.

*Soil.*—Chalka.

*Preparatory tillage.*—Two deep ploughings, each followed by a harrowing were done during the months of Aban 1342 F. and Azur 1343 F. (September and October 1933).

*Plotting.*—Twenty plots of  $5/8$  guntha ( $1/64$  acre) each in area were laid out for allowing 4 replications to each of the 5 varieties.

*Manuring.*—The field had been green manured with a crop of sunn-hemp. No other manure was given.

*Sowings.*—The seeds of the various varieties of Rabi jowar were drilled in rows 18" apart on the 23rd Azur 1343 F. (28th October 1933).

*Germination and growth.*—Germination was rather defective and the growth also was not satisfactory as a direct result of the excess of moisture in the soil due to flood inundation of the field.

*Weedings and Interculture.*—One weeding and one hoeing were done.

*Rainfall and Irrigation.*—No irrigation was given. Total rainfall received by the crop amounted to 2.45".

*Pests and Diseases.*—Nothing noteworthy.

*Harvest.*—Owing to the unsatisfactory growth of the crop, the maturing of the varieties also was not quite sound. All varieties were harvested on the 10th Ardi-behisht 1343 F. (14th March 1934). The following statement shows the yields.

Serial No.	Name of variety	AVERAGE YIELD OF GRAIN IN lbs. PER ACRE		
		1340-1341 F.	1341-1342 F.	1342-1343 F.
1	Camornia Dwarf ..	..	..	432
2	Local White ..	1,920	..	300
3	Maldandi ..	420	..	368
4	Markhandi ..	..	..	156
5	Sai Junna ..	..	..	232

The test could not be carried out in 1341-42 F. because of the flooding of the field; hence no results,

EXPERIMENT NO. 11.—*Comparison of Rabi Cotton varieties.*

*Object.*—To investigate the possibilities of growing Rabi cotton, and to select the most profitable variety for the district.

*Soil.*—Medium chalka.

*Preparatory tillage.*—Three ploughings each followed by a harrowing and an extra harrowing later were done.

*Plotting.*—Ten plots of one guntha ( $1/40$  acre) each in area were prepared and the varieties were replicated twice only. More replications could not be arranged owing to the other fields being under flood water.

*Manuring.*—No manure was applied.

*Sowings.*—Western, and Kumpta were sown 18" apart in rows 24" apart while Gadag, and the Coimbatore varieties were sown 24" apart in lines 30" apart. Seeds were hand dibbled on the 1st Dai 1343 F. (5th November 1933).

*Germination and growth.*—Germination was satisfactory, but the growth was rather stunted. Gap filling was done on the 22nd Dai 1343 F. (26th November 1933).

*Weedings and Interculture.*—Two weedings were done.

*Rainfall and Irrigation.*—Five irrigations in addition to 4.66" of rain were done.

*Pests and Diseases.*—Nothing noteworthy.

*Harvesting.*—The pickings started on the 6th Khurdad 1343 F. (10th April 1934) and the last picking was completed on the 24th Thir 1343 F. (28th May 1934). Three pickings were done in all.

The following statement shows the yields of seed cotton calculated in lbs. per acre.

S. No.	Name of variety	AVERAGE YIELD OF SEED COTTON IN LBS. PER ACRE				
		1338-1339 F.	1339-1340 F.	1340-1341 F.	1341-1342 F.	1342-1343 F.
1	Coimbatore No. 1 .	..	..	..	..	120
2	Coimbatore No.2 .	..	..	..	..	235
3	Gadag No. 1. ..	500	1,258	1,265	..	260
4	Kumpta ..	460	832	950	..	355
5	Western ..	360	780	955	..	565

The test could not be conducted during the year 1341-1342 F. owing to the inundation of fields with flood water.

The yields during the year under review are low.

[Statement,

*Non-experimental crops.*—Some fodder and general crops were grown on the fields not occupied by the experiments in order to find fodder for the animals, propagation of seed, vegetables for sale and green manuring, etc. The following statement shows the outturns of such crops together with the area under each.

S. No.	Name of crop	AREA		ACTUAL OUTTURN IN LBS.			Remarks
		Acres	Guntahs	Grain	Fodder		
					green	dry	
1	Arhar .. ..	4	35	3,857	..	..	Chillies.
2	Castor .. ..	4	20	4,702	..	..	
3	Chillies .. ..	..	15	..	170	34	
4	Cotton Kharif .. ..	..	2	44	..	..	
5	Cotton Rabi .. ..	..	11	77	..	..	Seed cotton.
6	Fodder mixed .. ..	..	30	..	12,902	..	Seed cotton.
7	Gram .. ..	1	..	105	216	..	
8	Ground-nuts .. ..	8	20	4,698	..	..	
9	Jowar Kharif .. ..	4	2	4,432	..	42,000	
10	Jowar Rabi .. ..	..	20	45	..	300	dry pods.
11	Jowar Fodder .. ..	3	14	2,670	..	33,715	
12	Lucerne .. ..	..	20	..	14,105	..	
13	Maize .. ..	..	15	26	160	..	
14	Oats .. ..	..	20	..	322	..	green cobs.
15	Paddy Abi .. ..	2	29	9,568	..	11,464	
16	Paddy Tabi .. ..	2	29	3,172	..	6,456	
17	Sunnhemp .. ..	9	10	green manured			
18	Sesamum .. ..	..	14	37	..	..	23,935 canes.
19	Sugarcane .. ..	..	23½	..	..	..	
20	Tobacco .. ..	2	2	..	..	..	
21	Vegetables .. ..	2	..	..	..	..	
22	Wheat .. ..	..	21	123	..	363	worth Rs. 531-14-1.

An area of  $1\frac{1}{2}$  acres was placed under the Economic Botanist for growing his castor strains.

Another half an acre was used by the Economic Botanist for carrying out work on Paddy.

All labour and material, etc., for the above areas was supplied by the Farm.

*Permanent Improvements.*—Slight changes in the general lay-out were effected. Levelling of the fields continues as time and opportunity comes to hand. A big pit known as Kormat Baoli has been filled up, and the land made available for cultivation.

The two sheds have been removed from near the gate to the vicinity of Banyan well; where they are in a more central position, and the field originally occupied by them has been made cultivable.

A new road has been prepared on the side of the Babool well.

*Buildings.*—The construction of some temporary sheds for the stores and cattle, etc., has been completed.

Three culverts have been constructed under the roads.

Many other minor improvements too numerous to be recorded have been effected.

*Cattle.*—All the twelve pairs of cattle remained in good health generally. One bullock died towards the close of the year. Another two pairs are getting old.

*Compost Pits.*—Fifteen new pits were dug out near the Banyan well and put in use. The old pits were filled up and the field recovered for cultivation. These pits have been supplying most of the manurial requirements of the Farm.

*Implements.*—The following new implements were added to the stock already present.—

(1) Cole's corn planter	..	..	1
(2) Maize sheller	..	..	1
(3) Lawn Mower	..	..	1
(4) Drilling machine	..	..	1

Spare parts were purchased as necessary to replace the wear and tear of the implements in use.

*Farm Demonstration.*—A demonstration of the working of implements, show of seeds, manures, and crops, etc., was held in the first week of Azar 1343 F. (November 1933). Cultivator class of the district took keen interest and attended in large numbers. Instructive lectures and some films of agricultural interest were also shown. The attendance was estimated to be above 5,000 persons.

In addition to the Revenue Officers, the members of the Co-operative and Veterinary Departments also took keen interest. A show of the industries of the district was also arranged by the First Talukdar, Mirza Ghulam Mahmood Baig Saheb.

*Finances.*—The expenditure on the farm during the year 1342–1343 F. amounted to Rs. 8,587-8-4. The total receipts on account of the farm income, during the year amounted to Rs. 1,934-3-2.

*Charge and Establishment.*—Mr. Syed Hamid Ali remained in charge of the farm as Superintendent, throughout the year, and managed the farm affairs with ability and foresight. He had also to look after the district agricultural work during the absence on leave of Mr. Prithvi Raj, Agricultural Officer, Mahbubnagar.

Mr. Mahboob Ali, Jagirdar, Probationary Agricultural Officer, worked on the farm as Assistant Superintendent throughout the year under review.

Mr. Omer Khan has been working as Fieldman.

A. SOOFEE,  
*Deputy Director of Agriculture,*  
*Western Telingana Division,*  
*Himayatsagar, Hyderabad-Deccan.*

15-5-1344 F.

Statement showing the record of rainfall at the Government Demonstration Farm, Mahbubnagar for the year 1342-1343 Faslî.

Date	RAINFALL IN INCHES.											
	Amer- dad	Shah- rewar	Mehir	Aban	Azur	Dai	Bah- mon	Isfin- dar	Far- warî	Arde- behist	Khur- dad	Thir
1	0.60	0.95	..	0.19	..	..	..	..	..	..	0.90	..
2	..	0.31	..	..	..	..	..	..	..	..	..	..
3	0.06	0.33	0.03	0.92	..	..	..	..	..	..	..	..
4	0.60	0.82	0.05	0.27	..	..	..	..	..	..	..	..
5	0.16	..	0.20	0.11	..	..	..	..	..	..	..	..
6	0.23	0.01	..	0.86	..	..	..	..	..	..	..	..
7	0.15	..	..	0.08	..	..	..	..	..	..	..	..
8	0.03	0.35	..	1.07	..	..	..	..	..	..	..	..
9	0.02	0.24	..	..	..	..	..	..	..	..	..	..
10	0.75	0.17	..	..	..	..	..	..	..	..	..	0.10
11	0.62	0.03	..	..	..	..	..	..	..	..	..	..
12	0.10	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	0.05	..	..	..	..	..	..	0.09
14	..	..	..	..	2.50	1.50	..	..	..	..	0.90	..
15	0.31	..	0.03	..	3.90	0.45	..	..	..	..	0.07	..
16	..	..	..	..	..	..	..	..	..	..	0.15	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	0.05	..	..	..	..	..	..	..	..	..
19	..	0.04	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	0.13	..	..	..	..	..
21	0.04	0.04	0.70	..	..	..	0.37	..	..	..	..	..
22	..	0.23	0.07	..	..	..	..	..	..	..	..	..
23	0.03	0.07	..	..	..	..	..	..	..	..	..	..
24	0.14	0.65	0.09	..	..	..	..	..	..	..	..	..
25	0.50	3.00	..	0.04	..	..	..	..	..	..	..	..
26	0.07	1.57	0.80	..	..	..	..	..	..	..	..	..
27	..	0.74	..	..	..	..	..	..	..	..	..	..
28	0.08	0.05	0.20	..	..	..	..	..	..	..	..	..
29	..	0.74	0.83	0.18	..	..	..	..	..	..	..	0.04
30	..	0.07	2.00	..	..	..	..	..	..	..	..	..
31	..	0.15	..	..	..	..	..	..	..	..	..	0.17
Total..	4.49	10.06	5.05	3.72	6.45	1.95	0.50	..	..	..	2.02	0.40

Grand total for the whole year is 34.64"

*Government Demonstration Farm, Mahbubnagar.*

The Programme of Research and Experimental work to be carried out for the year 1343-1344 F., is as follows:—

- (1) Manurial Experiment with Nicifos on Paddy.
- (2) Ploughing Experiment with Paddy.
- (3) Comparison of Kharif Jowar Varieties.
- (4) Comparison of Bajra Varieties.
- (5) Comparison of Ground-nut Varieties.
- (6) Comparison of Arhar Varieties.
- (7) Comparison of Kharif Cotton Varieties.
- (8) Comparison of Wheat Varieties.
- (9) Comparison of Gram Varieties.
- (10) Comparison of Rabi Jowar Varieties.
- (11) Comparison of Rabi Cotton Varieties.

*Report on the experiments on silted area, in Rampur village.*

The experiments on this area were started in the previous year. A good start was made and the cultivators became enthusiastic in the conduct of the experiments. During the year under review, however, some troubles consisting mostly of the proper crop husbandry did arise. Out of the two cultivators owning these lands, one with larger area had the calamity of getting entangled in some private troubles cropping up in his own family with the result that he could not give proper attention to his agriculture. As a direct result of this neglect, most of his crops got ruined during the year under review.

The lands for the experiments had prepared as best as the conditions would permit, and sowings were effected. But some of the crops, *e.g.*, maize and ballar died a few days after germination owing to the excess of moisture in the soil. The others, *e.g.*, sugar-cane, and sunn hemp, onions, paddy, etc., which did grow, got grazed by cattle straying in from all round owing to the carelessness of the cultivators. Even the operations of weeding and irrigation were not properly attended.

Arrangements are being made to effect some changes in working scheme for future in order to safeguard the proper conduct of experiments.

A. SOOFEE,

*Deputy Director of Agriculture,*

*Western Telingana Division,*

*Himayatsagar, Hyderabad-Deccan.*

15-5-1344 F.

*Report on the cultural experiments conducted in the deep black soil, at Ebrahimpeth during the Tabi season of the year 1342-43 Fash.*

Cultural experiments on deep black soils at Ebrahimpeth were started during the Tabi season of the year under review with the object of investigating the possibility of raising profitable crops on such soils under irrigated conditions. These lands had been resigned by the cultivators some three years ago on the plea that such soils cannot grow any profitable crops under irrigation.

Ebrahimpeth is situated about 2 miles to the west of Borlum, the headquarters of Taluka, on the loop road from Durki to Tiramalapur. It lies at a distance of about 16 miles from Rudroor Farm, and 31 miles from Nizamabad Railway station on H.E.H. the Nizam's State Railways. The experimental plots lie on the roadside.

Soil of these experimental plots consists of deep-lying Regur. Total area of the plots does not exceed five acres at present. Irrigation water is supplied by the distributary of the canal.

Work was started in great haste in Azur 1343 F. (October 1933). The local revenue officials arranged to get on hire the labour, implements, and animals according to requirements. A Kamgar of the district propaganda staff was stationed on these plots to carry out the details of operations according to the instructions afforded to him once or twice weekly by the Superintendent, Agricultural Farm, Rudroor.

Plots of more or less  $\frac{1}{4}$  acre each in area were laid out. Lands were hurriedly prepared for sowings. The plot for paddy was divided into small sub-plots which were properly levelled.

[Statement.

The areas placed under various crops, the number of irrigations applied, and the yields calculated per acre are shown in the following statement:—

Name of crop	Area in guntas	Date of sowing	No. of irrigations	Date of harvesting	Yield in lbs. per acre	Remarks
Wheat ..	9	28-1-1343 F.	1	27-5-1343 F.	138	No manure given.
Gram ..	6	30-1-1343 F.	1	27-5-1343 F.	173	do
Cotton ..	9	28-1-1343 F.	6	7-8-1343 F.	64	do
Ground-nuts ..	9	30-1-1343 F.	5	22-6-1343 F.	329	do
Onions ..	9	14-3-1343 F.	7	18-8-1343 F.	1,564	Farm-yard manure applied.
Paddy 504 ..	10	24-4-1343 F.	18	14-8-1343 F.	1,680	do

Sugar-cane Co. 213, and Co. 290 varieties were also sown in small plots. The germination was satisfactory and the growth average. Sugar-cane plots were given farm-yard manure.

The paddy crop yielded well. The sugar-cane crop in the field can be called an average crop. The results of the season, however, indicate that experimental work carried out on proper lines may prove successful. A proper scheme for the conduct of experiments will be framed after seeing the results of another season.

A. SOOFEE,

*Deputy Director of Agriculture,*

*Western Telingana Division,*

*Himayatsagar, Hyderabad-Deccan.*

15-5-1344 F.

*Annual Report of the Government Main Experimental Farm, Parbhani, for the year 1342-43 F.*

*Introduction.*—The Farm was started in Meher 1337 Fasli. It covers an area of 265 acres of which 210 acres are under cultivation, 8 acres are reserved for grazing, and the remainder is under buildings, roads, drains, and compost factory.

*Situation.*—The farm is situated in the centre of the Mahratwada tract, the soil being of deep black nature—commonly known as black-cotton soil—with a substratum of murrum, varying in depth from 1 to 12 feet. The elevation is 1,338 feet above sea-level situated North Latitude  $19^{\circ}$  and East Longitude  $77^{\circ}$ . It is about a furlong to the south of the Parbhani Railway station, but has no connection with the town, or station by a pucca road, the only approach being by the cart tract.

*Object of the farm.*—This is a main experimental farm intended for the study of the agricultural problems of the Marathwada Division, and specially meant for evolving better types of cotton, ground-nuts, sugar-cane, jowar, and wheat, and finding out cultural and manurial treatments to obtain the maximum yields at the minimum of cost.

*Soil.*—The soil of the farm represents the various kinds of soils of the Godavari Division ranging from medium black to deep black. A small area also represents the light soil suitable for irrigation.

*Staff.*—The farm is managed by a Superintendent, an Assistant Superintendent, with the assistance of Agricultural Graduates who are sent on for training during their two years' of probation. During the period under report Mr. Sheik Mohd. Yousuff was Superintendent, and Mr. Burhanuddin Hussain worked as Assistant Superintendent till Dai 1342 Fasli when he was transferred to Aurangabad as District Agricultural Officer and his place was taken up by Mr. D. I. Ahmadi. Messrs. Jamallullah, Hatim Ali, and Razvi continued to work on the farm while Messrs. V. Chari and M. A. Akil joined during the period under report. Mr. Hatim Ali has been confirmed while the rest have not yet completed their probationary periods.

*Season.*—Highest maximum temperature was recorded in the month of May ( $113^{\circ}$  F.) and the lowest maximum temperature in the month of January





(73° F.). The lowest minimum temperature was recorded in January (37° F.) and the highest minimum temperature in May (85° F.). The average rainfall for 24 years at the station is 32.86". This year the rainfall was 39.85" being 6.72" more than normal. The distribution has been fairly good and Kharif and Rabi sowings could be completed in time and the germination of both was exceptionally good. But still the crops did suffer, cotton due to the abnormal rainfalls in the months of Aban and Bahmon. A chart comparing the monthly rainfall during the period under report with the monthly averages of 24 years, and the monthly average maximum and minimum temperatures with the three-yearly months maximum and minimum averages is attached herewith, which will give a correct idea of the season. The cold drought during the end of January and the beginning of February did also affect Rabi jowar yields. The high temperatures in April and May affected the sugar-cane crop especially local cane.

*Rainfall statement, 1342-43 Fasli.*

Month	No. of rainy days	RAINFALL IN INCHES				Total
		1st to 7th	8th to 15th	16th to 23rd	24th to end	
June ..	18	1.65	0.94	6.61	0.51	9.71
July ..	16	1.24	6.69	0.44	1.92	10.29
August ..	16	1.05	2.38	0.73	5.46	9.62
September ..	19	0.85	4.25	0.67	1.07	6.84
October ..	3	..	..	1.23	..	1.23
November ..	1	..	..	0.11	..	0.11
December ..	3	..	..	1.06	0.13	1.19
January ..	2	0.5	0.18	..	..	0.28
February ..	..	..	..	..	..	..
March ..	..	..	..	..	..	..
April ..	2	..	0.11	0.25	..	0.36
May ..	..	..	..	..	..	..
<b>Total ..</b>	<b>80</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>39.58</b>

*Irrigation.*—Most of the area of the farm is under dry cultivation depending upon the South-west monsoon for the Kharif crops and the North-east monsoon for the Rabi. There are, however, seven wells on the farm which are used mainly to irrigate sugar-cane, fodder jowar and the horticultural area.

*Experiments.*—The following experiments are conducted at the farm:—

1. Sugar-cane varietal test.
2. Two cotton varietal tests.
3. Ground-nut varietal test.
4. Paddy as a possible crop on black-cotton soil.
5. Kharif jowar varietal test.
6. Rotational test.
7. Seed-rate test in ground-nut.
8. Rabi jowar varietal test.
9. Wheat varietal test.
10. Gram varietal test.
11. Linseed preliminary varietal test.
12. Effect of green manure on wheat.

The statements and results are given in the following pages.

I.—*Sugar-cane varietal test.*—The following varieties of sugar-cane:—(1) Co. 213; (2) Co. 223; (3) Co. 281; (4) Co. 290; (5) Local; (6) D. 109; (7) P.O.J. 2878; (8) E.K. 28, were replicated four times, and grown under equal treatment to determine the most suitable variety for this tract in point of yield, and earliness with minimum number of irrigations. For details refer to Table No. 1 while the following are the conclusions arrived at:—

Jaggery yields of sugar-cane varietal test in pounds per  $1/80$ th acre-plot.

*Calculations were done by Fisher's method.*—III block was attacked severely by *Striga Densiflora* and in that block beds of P.O.J.; E.K. 28, and D. 109 were very severely attacked; therefore this block was excluded for calculation purposes.

*Analysis of variance.*

Due to :—	Sum of squares	Degrees of freedom	Variance
Total :— ..	21,755.19	23	94.82
Variety :— ..	15,727.79	7	2,246.82
Block :— ..	2 854.97	2	1,247.48
Error :— ..	3,172.48	14	226.60

Therefore any difference between any two means greater than 83.172 is significant.

Thus this year only Co. 213 is significant as the difference between the means of the local and Co. 213 is 87.3.

*Remarks.*—The above-mentioned eight varieties were replicated four times. It was found that amongst the four thick varieties E.K. 28 had the highest germination, *i.e.*, 58.22 per cent., and that Co 213 topped the list having 70.17 per cent. germination.

There was a slight borer attack in the beginning, mostly in the Local and D. 109 varieties. The Local variety was very much affected in the hot season. It seems that it requires frequent irrigations than other varieties which is not possible in case of varietal test where uniform treatment is needed. D. 109 was found to lodge very badly in the latter part of the season particularly when there was late shower. This is because of its having heavy tops. Co. 223 goes dead straight.

Harvesting was started 375 days after planting.

*Striga densiflora* attacked severely in the Block III and mostly beds of P.O.J.; E.K. 28 and D. 109 in that block were affected. From the analysis it is apparent that only Co. 213 is significant and other varieties are out of question being non-significant.

[*Statement.*

**CHART SHOWING THE FIGURES OF SUGAR-CANE VARIETAL TEST 1342-1343 FASLI.**

*Government Main Farm, Parbhani.*

**PLOT No. D. 29.**

Serial No.	Variety	AVERAGE OF THREE BEDS OF 1/80TH OF AN ACRE				OUTTURN PER ACRE				Brix Readings		Juice		Jaggery		Remarks
		No. of canes	Wt. of canes in lbs.	Wt. of juice in lbs.	Wt. of jaggery in lbs.	No. of canes	Wt. of canes in lbs.	Wt. of juice in lbs.	Wt. of jaggery in lbs.			Cane	Juice	Jaggery	Cane	
1	Co. 213	740.0	1517.0	1046.7	153.8	59,200	1,21,360	88,736	12304.0	17.3	69.0	14.7	10.1			
2	Co. 223	529.7	1272.7	891.3	139.3	47,416	1,01,816	71,304	11144.0	17.0	70.0	15.6	10.9			
3	Co. 281	599.0	1036.3	679.3	122.8	47,920	82,904	54,344	9824.0	19.3	65.5	18.0	11.8			
4	Co. 29	545.3	1256.6	873.0	146.8	43,624	1,00,528	69,840	11744.0	18.8	69.4	16.8	11.7			
5	E. K. 28	242.0	1034.3	754.3	135.3	19,360	82,744	60,344	10824.0	17.2	72.9	17.9	13.1			
6	P. O. J. 2878	322.3	1010.3	691.7	133.0	25,784	80,824	55,336	10640.0	20.3	68.4	19.2	13.2			
7	D. 109	276.7	1233.7	878.7	144.0	22,136	98,696	70,296	11520.0	17.0	71.2	16.3	11.7			
8	Local	275.7	692.7	524.7	66.6	22,056	55,416	41,976	5320.0	16.0	75.7	12.7	9.6			

II.—*Cotton varietal tests.*

I.—*Varietal Test No. 1.*—This was a comparative test for eight relatively long stapled cotton grown in randomized plots replicated eight times. This test was carried out on three sites on the farm representing soils of varying depths. The yields of one site were not significant by the “Z” test, hence these results are excluded from consideration while the results of the remaining two are attached herewith.

:

[*Statement.*

*Cotton Varietal Yield Trial No. 1.*

*Site.*—Plot D. 25, Government Experimental Farm, Parbhani.  
*Comparison of eight varieties.*—Viz., Gaorani Umri. Gaorani 44.  
 Gaorani 4. Gaorani 55.  
 Gaorani 6. Bani 306.  
 Gaorani 13. Parbhani 25.

*System of Replication.*—8×8 randomized block arrangement.

*Area of each sub-Plot.*—1/345th acre (12 feet × 10.5 feet).

*Seed Sown.*—21st June 1933.

*Soil.*—Typical Black soil of medium depth.

*Harvested.*—In four pickings from middle of October to the end of December.

*Previous Crop.*—Ground-nut.

*Summary of Results.*

	MEAN YIELD OF SEED COTTON IN LBS. PER ACRES						Parbhani 25	General mean	Standard error of mean yields	Whether varietal yields are signi- ficant by "Z" test	Critical difference (in lbs. per acre).
	Gaorani Umris	Gaorani 4	Gaorani 6	Gaorani 13	Gaorani 44	Gaorani 55	Bani 306				
1. Per acre ..	770.3	759.5	789.8	905.6	842.7	806.2	667.6	896.6	34.88	..	98.65
2. Percentage on general mean .	95.6	94.2	98.0	112.4	104.5	100.0	84.1	111.2	4.33	Yes	..
3. Percentage on 'Control' Gaorani Umri ..	100.0	98.6	102.5	170.6	109.4	104.7	87.9	116.4	4.53	..	..

1. Gaorani 4 = Gaorani 6 = Gaorani Umri.
2. Parbhani 25 = Gaorani 13 > Gaorani 6 > Bani 306.
3. Gaorani 44 = Gaorani 55 > Bani 306.

### *Cotton Varietal Yield Trial No. 1.*

*Site.*—Breeding Area, Government Experimental Farm, Parbhani.  
*Comparison of eight varieties.*—Viz., Gaorani Umri. Gaorani 44.  
 Gaorani 4. Gaorani 55.  
 Gaorani 6. Bani 306.  
 Gaorani 13. Parbhani 25.

*System of Replication.*—8×8 randomized block arrangement.

*Area of each sub-Plot.*—1/382nd acre (19 feet×6 feet).

*Soil.*—Typical Black Cotton Soil, Shallow.

*Seed sown.*—21st June 1933.

*Harvested.*—In four pickings from October to December.

*Previous Crop.*—Gram.

### *Summary of Results.*

	MEAN YIELD OF SEED COTTON IN LBS. PER ACRE							Parbhani 25	General mean	Standard error of mean yield	Whether varietal yields are signi- ficant by "Z" test	Critical difference (in lbs.) per acre
	Gaorani Umri	Gaorani 4	Gaorani 6	Gaorani 13	Gaorani 44	Gaorani 55	Bani 306					
1. Per acre	..	542.8	637.8	60.5	604.9	572.1	501.8	611.8	592.0	31.24	..	88.37
2. Percentage on General mean	..	91.7	107.7	109.9	102.2	96.6	84.8	103.4	100.0	5.28	Yes	..
3. Percentage on 'control' Gaorani Umri.	..	100.0	117.5	119.8	111.5	10.4	92.4	112.7	109.1	5.76	..	..

1. Gaorani 6 = Gaorani 4 > Gaorani Umri.

2. Gaorani 6 = Gaorani 4 > Gaorani 13 = Gaorani 55 = Parbhani 25 > Bani 306.

On the basis of yield of seed cotton Gaorani 4, Gaorani 6 and Parbhani 25 are significantly higher yielding than Gaorani Umri, the "Control" variety. It will be noted that the three higher yielding varieties viz., Gaorani 4, Gaorani 6 and Parbhani 25 are better than Gaorani Umri in both halo-length and ginning outturn. Gaorani 55 seems another likely type. Therefore the varietal tests in the next season will be confined to these four strains (Gaorani 4, Gaorani 6, Gaorani 55 and Parbhani 25) and Gaorani Umri.

II.—*Varietal test No. 2*—The object was to determine the most suitable substitute for the mixed crop now grown in Aurangabad and Parbhani districts. The yields were significant by the "Z" test. The results are summarised in the following statement:—

*Cotton Varietal Yield Trial No. 2.*

*Site.*—Breeding Area, Government Experimental Farm, Parbhani.  
*Comparison of eight varieties.*—Viz., Aurangabad Local, Parbhani 21.  
 Gaorani 9. Parbhani 701.  
 Gaorani 12. Banilla.  
 Parbhani 9. Havri 3.

*System of Replication.*—8×8 randomized block arrangement.

*Area of sub-Plot.*—1/32nd acre (19 feet×6 feet).

*Soil.*—Typical Black Cotton Soil, Shallow.

*Seed Sown.*—23rd June 1933.

*Harvested.*—In four pickings from middle of October to the end of December.  
*Previous Crop.*—Gram.

*Summary of Results.*

	MEAN YIELD OF SEED COTTON IN LBS. PER ACRE						General Mean	Standard error of mean yield	Whether varietal yields are significant by 'Z' test	Critical difference (in lbs. per acre)
	Havri 3	Gaorani 9	Parbhani 21	Aurangabad Local	Parbhani 9	Gaorani 12	Banilla	Parbhani 701		
1. Per acre ..	1040.4	970.5	903.9	889.4	771.5	727.7	669.6	648.5	..	175.36
2. Percentage on general mean	126.6	117.1	109.1	107.3	93.1	87.8	80.8	78.3	Yes	..
3. Percentage on 'Control' Aurangabad Local.	118.1	109.1	101.6	100.0	86.8	81.8	75.3	72.7	..	..

1. Havri 3 = Gaorani 9 = Parbhani 21 = Aurangabad Local > Banilla = Parbhani 701.

2. Havri 3 = Gaorani 9 = Parbhani 21 > Gaorani 12.

On the basis of yield of seed cotton, Havri 3 is significantly higher yielding than "Aurangabad Local" the "Control" variety. Gaorani 9 and Parbhani 21 are about equal in yield to "Aurangabad Local." Banilla and Parbhani 701 are definitely low yielding.

### III.—*Varietal test of ground-nut.*

*Object.*—To determine which of the following varieties is most suitable to this division:—

- |                         |                     |
|-------------------------|---------------------|
| 1. Akola 10.            | 4. Big Japan.       |
| 2. Ranchi or (Kanki 17) | 5. Spanish pea-nut. |
| 3. Small Japan.         | 6. Local (Ghungru). |

#### *Record of ground-nut V.T. 1342-43 F.*

S. No.	Variety	Mean yield per 1/48th acre		Average yield per acre		Order of Merit
		lbs.	Ozs.	lbs.	Ozs.	
1	Akola 10 ..	30	10.6	1,471	12.8	V
2	Ranchi ..	32	3.5	1,486	8.0	IV
3	Small Japan ..	40	14.8	1,964	6.4	I
4	Big Japan ..	24	8.3	1,176	4.4	VI
5	Sp. Peanut ..	39	8.7	1,398	1.6	II
6	Local ..	34	9.0	1,659	0.0	III

*Remarks.*—Spanish pea-nut, Small Japan and Local varieties germinated one day earlier than the other three varieties. Germination of Akola 10 was very poor. Gap filling was done, still the defects could not be remedied. Spanish pea-nut, Small Japan and Local were found early in ripening and they were ready for harvest in 103 days while Akola 10, Big Japan and Ranchi took 120 days for maturing. Harvesting of Big Japan is very costly as nearly 50 per cent. is left in the ground while uprooting is done. In other varieties except Local 3 to 5 per cent. are left in the ground, while in the Local the percentage increases as the mixture of Big Japan increases.

IV.—*Kharif paddy. (Abi)*

*Object.*—To determine whether it is possible to grow paddy on black cotton soil of the Godavari Division.

*Remarks.*—The crop was very severely attacked by the stem-borer and moreover this being the new land the growth was very stunted and patchy as is apparent from the yield figures. Thus no conclusion can be drawn from the results.

*Yield.*

Plot No.	Variety of crop or treatment	OUTTURN OF EACH PLOT IN LBS.		Remarks
		Sheaves lbs.	Grian lbs.	
1	Coarse paddy No manure ..	8	0-5.5	
2	Manure .. ..	14	6-0.5	
3	No manure ..	12	2-15	
4	Manure .. ..	25	14-10	
5	No manure ..	36	20-6	
6	Manure .. ..	48	35-0	
7	No manure ..	50	38-15.5	
8	Manure .. ..	35	22-13	

*Rabi paddy. (Tabi)*

*Object.*—Same as Kharif.

*Remarks.*—The Rabi crop did not thrive from the very beginning. It used to deteriorate every day. At last on 22-5-1343 F. the last irrigation was given and the cultivation was stopped as it was found that hardly about 25 per cent. of plants were left in beds in very stunted and unhealthy condition.

V.—*Varietal test of Kharif jowar.*

*Object.*—To determine the suitability of the following six varieties of Kharif jowar:—

- |              |                  |
|--------------|------------------|
| 1. Godgaria. | 4. Varadi.       |
| 2. Ramkhel.  | 5. Nanded white. |
| 3. Saoner.   | 6. Alaspuri.     |

*Remarks.*—This plot was overflowed several times in this rainy season. The crop was very patchy and stunted, therefore no conclusion can be drawn from this experiment.

VI.—*Rotational experiment.*

*Object.*—In the Mahratwadi the usual rotation is two-yearly and this experiment is being carried out with a view to find out whether three-yearly rotation will be better and also to find out the best rotation which can be adopted by the ryots.

*Mean yield of the Rotational Experiment 1342-43 F.*

Crop in 1342-43 F.	Serial No.	Crop in 1341-42 F.	AVERAGE YIELD IN LBS. & OZS. PER TWO GUNTA BEDS				
			Cotton		Grain		Fod-der lbs.
			lbs.	Ozs.	lbs.	Ozs.	
Cotton G. 4 ..	1	Rabi jowar ..	23	0.1	..		..
Do ..	2	Ground-nut ..	33	3.6	..	..	..
Do ..	3	Kharif jowar ..	8	12.0	..	..	..
Do ..	4	Ground-nut ..	14	5.2	..	..	..
Ground-nut ..	5	Rabi jowar ..	37	7.5	..	..	..
Do ..	6	Kharif jowar ..	25	1.0	..	..	..
Rabi jowar ..	7	Cotton ..	..	..	50	10.0	338.6
Kharif jowar ..	8	Cotton ..	..	..	37	3.7	478.9

*Remarks.*—No conclusion can be drawn from this experiment, before five years. This year the whole plot was inundated several times in the monsoon, therefore cotton beds were severely affected. From the above table it is apparent that cotton after ground-nut has yielded more, than cotton after jowar. No. 4 shows less yield because it suffered much due to water logging. For Kharif jowar the season was not favourable while for the Rabi it was normal.

### VII.—Seed rate experiment.

*Object.*—To determine which of the following seed-rates is suitable for this division:—

- I. 30 lbs. per acre.
- II. 40 lbs. per acre.
- III. 60 lbs. per acre.
- IV. 80 lbs. per acre.

*Remarks.*—No harvest could be had from bed Nos. 1, 2, 7, 8, 9, 16 as they were spoiled on account of water logging. Pod formation was also not complete and seeds were quite undeveloped. No conclusion can be drawn from this experiment.

### VIII.—Varietal test of Rabi jowar.

*Object.*—The following six varieties are under trial:—

- |              |               |
|--------------|---------------|
| 1. Dagdi.    | 4. Bir white. |
| 2. Maldandi. | 5. Bidari.    |
| 3. Lakdi.    | 6. Kamalpuri. |

to find the best variety for the Division in point of yield of both fodder and grain.

Serial No.	Variety	AVERAGE YIELD PER BED OF 1/48TH ACRE			AVERAGE YIELD PER ACRE			Order of Merit on grain
		Grain		Fodder	Grain		Fodder	
		lbs.	Ozs.	lbs.	lbs.	Ozs.	lbs.	
1	Maldandi ..	9	13.5	59.7	472	8.0	2865.6	V
2	Lakdi ..	14	5.7	54.0	689	1.6	2592.0	I
3	Bir white ..	7	1.5	62.5	340	8.0	3000.0	VI
4	Dagdi ..	11	10.8	54.8	560	6.4	2630.4	III
5	Kamalपुरी ..	18	5.6	53.3	640	2.8	2558.4	II
6	Bidari ..	10	3.0	72.5	489	0.0	3480.0	IV

*Observations.*—This year's timely rains helped the germination of the Rabi crops, which was found to be very satisfactory. About 12 days after sowing thinning was done and one plant per seed hole was kept. It was observed that the Dagdi variety was the earliest and Bidari was the latest in flowering. From 4 to 8 days were required for complete emergence of cobs by the different varieties.

IX.—*Varietal test of wheat.*

*Object.*—The following six varieties of wheat were tried in dry condition.

- |                       |                         |
|-----------------------|-------------------------|
| 1. 38 rust resistant. | 4. Bansi local.         |
| 2. Aur. 461-A2.       | 5. Osm. 85-6.           |
| 3. Osm. 83-4.         | 6. Cawnpore awned 13-A. |

*Calculation of wheat V.T. 1933-34 A.D. (1342-43 F.)*

Serial No.	Variety	Block I	Block II	Block III	Block IV	Block V	Block VI	Mean yield per bed 1/48th acre	Mean yield per acre
1	Aur. 461-A2	731.5	333.5	399.5	700.5	231.5	318.5	28-12.8	1382-6.4
2	Osm. 85-6	587.0	496.5	707.0	311.5	706.5	257.5	31-15.0	1533-0.0
3	Osm. 83-4	524.5	613.5	302.0	588.0	345.0	287.5	27-11.3	1329-14.4
4	R. R. 38	364.5	412.5	281.0	177.0	404.0	744.0	24-13.2	1191-9.6
5	Caw. 13A	510.5	502.0	446.5	298.5	375.5	380.5	26-2.9	1250-11.2
6	Local ..	783.1	659.0	465.3	281.8	293.9	272.0	28-11.2	1377-9.6

*Analysis of variance.*

Due to :—	S. S.	Degrees of freedom	Variance
Total :—	10,02,587.38	35	28,645.32
Variety :—	46,256.52	5	9,251.304
Block :—	1,91,314.36	5	38,262.87
Errors :—	7,65,016.50	25	30,600.66

$$\frac{S^2}{2} = \frac{9251.304}{2} = 0.302.$$

But *vide* table III of P.C. Mahalanobis.

$$\frac{S^2}{2} = 2.603, \text{ therefore the experiment is non-significant.}$$

Thus the superiority of varieties cannot be judged.

*X.—Varietal test of gram.*

*Object.*—Six varieties of gram are under trial:—

- |             |              |
|-------------|--------------|
| 1. Local.   | 4. Pusa 17   |
| 2. Sabur.   | 5. Pusa 25.  |
| 3. Gwalior. | 6. Lyallpur. |

*Results of gram V.T. 1342-43 F.*

Serial No.	Variety	Average yield per bed of 1/75.75 acre		Average yield per acre		Order of merit on grain
		lbs.	Ozs.	lbs.	Ozs.	
1	Gwalior ..	10	9.1	801	1.7	III
2	Pusa 17.	9	7.2	716	4.9	IV
3	Local ..	10	11.7	813	6.8	II
4	Lyallapur ..	8	13.3	669	6.5	V
5	Sabur ..	12	10.0	909	15.6	I
6	Pusa 25*	..	..	..	..	..

\* Seed was insect attacked. So Germination was bad.

*Observation.*—Germination of all the varieties except Pusa 25 was very satisfactory. Pusa 25 seed was insect attacked and in spite of putting 4 seeds per hole the beds were very patchy, so the variety was excluded from the experiment.

Local, Gwalior and Sabur were found to flower early and hence were ready for harvest earlier than Pusa 17, Pusa 25 and Lyallpur. The three varieties mentioned latter are not of very spreading type.

*XI.—Linseed varietal test.*

*Object.*—The following 21 varieties were obtained from the Economic Botanists of the Provinces mentioned below and they were tried under preliminary trial in order to select some good and suitable varieties for Varietal Test on the farm:—

S. No.	VARIETIES			SOURCE
1.	Local	..	..	Parbhani.
2.	Pusa	..	..	Pusa Farm.
3.	C.P.	..	..	Nagpur Farm.
4.	1206	..	..	Economic Botanist, Cawnpore, U.P.
5.	776	..	..	
6.	1193	..	..	
7.	483	..	..	
8.	A-1162	..	..	
9.	1150	..	..	
10.	477	..	..	
11.	1161	..	..	Economic Botanist, Nagpur, C.P.
12.	White	..	..	
13.	55	..	..	
14.	30	..	..	
15.	43	..	..	
16.	3	..	..	Imperial Economic Botanist, Pusa.
17.	L.H. 68	..	..	
18.	L.T. 124	..	..	
19.	L.H. 10	..	..	
20.	L.H. 55	..	..	
21.	L.H. 21	..	..	

The detailed results are mentioned in the statement below:—

[*Statement.*

# RESULTS OF THE LINSEED PRELIMINARY TRIAL 1342-1343 FASLI.

*Yields are in ounces per 1/92.19 acre bed.*

Blocks	Local	C. P.	C. P. White	C. P.	C. P.	Poona	C. P.	U. P.	C. P.	U. P.	Remarks
I ..	90.0	97.5	74.0	96.0	87.5	91.0	98.0	56.5	99.0	56.5	Practically in all the U. P. and Pusa varieties there was no branching and their growth was poor as compared to C. P. and Local varieties. The ten varieties in order of merit (I to X) marked above will be tried in the coming season and the rest have been discarded.
II ..	87.5	69.0	74.5	74.0	88.5	80.5	85.0	62.5	87.5	57.0	
III ..	88.0	84.5	62.0	87.0	72.5	67.5	76.0	46.5	75.0	53.0	
Mean ..	88.5	88.6	70.1	85.6	82.8	79.6	86.3	55.1	87.1	55.6	
Order of .. merit	I	V	VIII	IV	VI	VII	III	X	II	IX	

*XII.—Green manure on wheat.*

*Object.*—To find out whether wheat with green manure is a more profitable crop than simple wheat as grown ordinarily in the Godavari Division.

*Results of green-manuring experiment on wheat 1342-43 F.*

Serial No.	Treatment	Mean yield per 1/12th acre		Average yield per acre		Remarks
		lbs.	Ozs.	lbs.	Ozs.	
1	Wheat without green manure . .	50	8.0	606	0.0	Wheat plus green manure yielded 106 lbs. & 3.2 Ozs. more per acre.
2	Wheat with green manure .	59	5.6	712	3.2	

*Remarks.*—This year the wheat crop was heavily attacked by rust. In spite of this it is apparent that wheat with sunn-hemp has given 106 lbs. 3.2 ozs. more than ordinary crop. This year sunn-hemp was buried at the right time hence we see that the difference in yield is more prominent than that of last year.

*General crop.*

Fifteen varieties of cotton, four of ground-nut, four of jowar, two of wheat, lak, gram were grown as general crops for propagation. The results are as under:—

## Statement showing the yield of general crops.

Se- rial No.	Crop variety	Acreage	Total yield in lbs.	Average per acre in lbs.	Remarks
1	Cotton Gaorani 12 ..	6 $\frac{1}{8}$	1,467	244	
2	" " 13 ..	3	598	198	
3	" " 2 ..	1 $\frac{1}{2}$	687	458	
4	" " 9 ..	6	1,180	197	
5	" " 4A. ..	2	389	194	
6	" " 4 ..	4 $\frac{3}{4}$	783	172	
7	" " 48 ..	2 $\frac{1}{4}$	600	272	
8	" " 57 ..	1	319	319	
9	" " 6 ..	2 $\frac{1}{2}$	772	308	
10	" " 6A. ..	1 $\frac{1}{2}$	263	175	
11	" " 3 ..	2	470	235	
12	" " 59 ..	2	442	221	
13	" " 85 ..	$\frac{1}{2}$	152	304	
14	" " 88 ..	$\frac{1}{2}$	221	442	
15	" " 65 ..	1	509	509	
26	Lakh ..	5 $\frac{1}{2}$	545	99	
17	Gram ..	8	2,421	302 $\frac{1}{2}$	
18	Wheat Pusa 4. ..	4	2,372	593	
19	Wheat R. R. 38. ..	8 $\frac{1}{8}$	2,025	607 $\frac{1}{2}$	
20	Jowar Dagdi ..	10	8,910	891	Rabi.
21	" Maldani ..	4	2,780	695	"
22	" Ramkhel ..	7	2,088	298	Kharif.
23	" Saoner ..	3 $\frac{3}{4}$	769	205	
24	Ground-nut Akola ..	2	1,951	975 $\frac{1}{2}$	
25	" Ranchi ..	2	1,783	891 $\frac{1}{2}$	
26	" Small Japan..	21 $\frac{1}{8}$	2,153	922	
27	" Spanish Pea-nut.	46 $\frac{1}{2}$	41,593	897 $\frac{1}{2}$	

*Horticulture.*—For the first quarter of the year under report this section was under the Farm Superintendent with Mr. Mohibullah Farooqi as the Horticultural Assistant. Later it was handed over to the Horticulturist to the Government and now Mr. Mohibullah Farooqi works under his direct control.

*Pests and diseases.*—There was no severe attack of any pests during the period under report but a minor attack of stem borer was noticed in sugar-cane and immediate preventive measures taken. Thus the harm done was negligible. Striga parasite attacked sugar-cane and jowar (Kharif) severely in certain plots. In sugar-cane they were carefully eradicated but jowar plots were grubbed up as the only means of control. As usual there

was boll-worm attack in cotton, causing loss of about 10 per cent. of the crop. Rats troubled wheat and sugar-cane to a slight extent. Ordinary rat traps helped to check the trouble, and occasionally their holes were fumigated with Sulphur fumes.

Rust appeared on wheat as the season was very favourable for this but due to the varieties grown mostly being rust resistant the attack was not felt and did not materially affect the yields. Tikka disease appeared in ground-nuts specially in water logged areas.

*Manures and manuring.*—*Compost*—Manufacture of compost was continued by the simple Chinese method. The refuse from the field is used as bedding for the cattle where it gets mixed up with cowdung and soaked with urine and this is removed to the pits and spread in layers, trampled, watered, and covered with earth. Within 4 to 6 months, depending on the watering and the season, good compost manure ready for use is obtained. At an average in pits  $28 \times 12 \times 3\frac{1}{2}$  we obtained 18.8 cart-loads. The pits were watered four times during the whole period.

Nineteen pits of manure were manufactured out of which 358 cart-loads of manure were obtained and utilised on the Farm.

*Live-stock.*—The farm cattle remained in healthy condition during the year under report.

*Finance.*—The expenditure of the farm during the year under report amounted to Rs. 20,418-0-0 and the income to Rs. 5,346-4-8.

*Implements, Machinery, etc.*—It has been proposed to purchase a new Crude Oil Engine and replace the old Kerosene Oil one on the farm to economise in the fuel expenses. Need for another disc harrow was felt and a new one has been purchased. The Cotton Research Laboratory piping has been done, the main having been taken from the quarter-main of the last quarter.

A fairly permanent corrugated iron room has been made for the smithy near well No. 1 opposite the implement and cattle shed.

*Roads and drains.*—All the morrum roads have been patched up and sand carted for being spread during the monsoon.

The main drain which gave trouble in the last season due to want of sufficient gradient has been straightened out from the point where it occasionally overflowed and thus the distance and the turnings have been reduced. A better gradient has been obtained and now it is expected to work satisfactorily.

### POULTRY.

This new section was started in the month of Dai with an idea of testing the breeds which are liable to take the place of the country fowls and later to spread the efficient breed amongst the ryots and also to teach them the advantages of keeping poultry in sanitary and hygienic conditions. With this idea the following two breeds were obtained:—

- (1) Rhode Island Reds.
- (2) White Leghorns.

*Rhode Island Reds.*—The parents of these birds were obtained from the Lucknow Poultry Farm, and came of the Prince of Wale's strain. The birds were ten months old when they arrived on the Farm.

*White Leghorns.*—The parents of these were purchased from the Lucknow Poultry Farm and came of Elli's strain and were also ten months' old.

*Treatment.*—The birds are housed in the most economical and sanitary manner and fed systematically. Equal treatment being given to all of them.

Individual performance of the birds is regularly recorded and so far the Rhode Island Reds have proved better layers. But it is yet too early to give a definite opinion as we have had them only for about seven months. The records of which are as under:—

*Statement No. 1.—Showing the performance of each bird from the first of Dai 1342 Fasli to the end of Thir 1343 Fasli.*

Breed	Leg band No.	NUMBER OF EGGS LAID								Remarks
		Dai	Bah-man	Isfin-dar	Far-wardi	Ardi-behist	Khur-dad	Thir	Total	
White Leghorn.	488	6	25	21	11	4	3	1	71	
Do ..	489*	3	22	26	20	14	8	2	95	*489 died of dropsy on 21st Thir.
R. I. R. ..	457	5	25	26	18	15	4	..	98	
Do ..	459	2	24	26	26	20	3	5	106	

It will be noticed from the above statement that the birds laid profusely in Bahman, Isfindar and Farwardi and as the weather gets hot they decreased and practically stopped laying in the month of Thir.

*Hatching.*—As an incubator has not yet been purchased, the ordinary method was resorted to, and 8 to 10 eggs were set under each hen purchased locally.

*Statement No. 2.—Showing the results of hatching.*

Month	No. of eggs set	Eggs hatched	Eggs spoilt	Remarks
Dai .. ..	7	..	7	
Bahman .. ..	100	16	4	
Isfindar .. ..	88	86	12	
Farwardi .. ..	92	68	30	
Ardibehist .. ..	74	78	18	
Khurdad .. ..	8	15	33	
Thir .. ..	..	..	..	
Total .. ..	367	263	104	

Thus the hatching percentage was 71 on an average but as the temperature increased this decreased.

*Diseases and parasites.*—In the villages around epidemics did break out but due to the cleanliness and hygienic treatment of the birds on the farm none broke out here.

Only the White Leghorn cock suffered from Influenza but recovered with proper care within a fortnight. One White Leghorn hen however suffered from Dropsy and died on the 21st Thir.

Mortality amongst the chicks however was found very high due to the diarrhoea and constipation specially amongst the newly hatched ones in the month of Ardibehisht, and Khurdad. The chickens hatched during the severe summer months were found to need more nutrition suffered from roup but this was checked in time by giving Codliver Oil with their mash.

Cannibalism was noticeably on the increase and cutting the beaks and segregation did not affect a stop, the birds were destroyed as the only certain means of stopping it.

*Statement III.—Showing the mortality of chicks.*

Breed		No. of chicks hatched	No. of deaths	Death-rate
R. I. R.	..	137	73	53 %
W. L.	..	108	37	34 %

During the latter part of summer when it was found advisable not to set any more eggs they were sold for table after pricking with a pin.

*Live-stock.*—The farm now has one R.I.R. trio, and one W.L. pair. The chickens are 3 to 5 months old and have about 50 per cent. cockrels and 50 per cent. hens. Total number of chickens being 129 out of which 59 are R.I.R. and 70 W.L. All the deformed and offending birds are immediately disposed of.

DISTRIBUTION OF SEEDS.

The following statement shows the cotton, ground-nut, jowar, wheat and sugar-cane seed which was supplied for distribution amongst the cultivators of this division.

[*Statement.*

*List of seeds supplied for distribution by the Government  
Main Farm, Parbhani, during the year 1342-43 F.*

Kind of seed	NAME OF DISTRICT				
	Parbhani	Aurang- abad	Nanded	Latur	Grand total
Cotton seed :—					
Bulk Gaorani .. ..	..	..	1,876	..	1,876
Gaorani 4 .. ..	..	..	1,076	..	1,076
Gaorani 6 .. ..	..	..	739	..	739
Parbhani 25 .. ..	..	..	48	..	48
Gaorani 9 .. ..	788	..	..	..	788
Gaorani 12 .. ..	917	..	..	..	917
Gaorani 2 .. ..	467	..	..	..	467
Banilla .. ..	..	750	..	..	750
Ground-nut Akola 10 .	188	..	..	200	388
„ Spanish P... ..	600	1,240	650	..	2,490
„ Ranchi .. ..	90	..	250	..	340
Kharif. J. Savner .. ..	..	..	..	40	40
Do Godgaria.. ..	30	..	..	..	30
Do Impi. J. .. ..	90	100	10	..	200
Rabi J. Dagdi .. ..	388	400	20	..	808
Do Maldani .. ..	200	250	20	..	470
Wheat R. R. 38 .. ..	268 $\frac{3}{4}$	500	..	..	768 $\frac{3}{4}$
Do Pusa 4 .. ..	..	100	..	..	100
Sugar-cane P. O. J. ..	7,840	7,861	..	..	15,701
Do Co. 290 .. ..	1,600	1,280	..	..	2,880
Do E. K. 28 .. ..	..	1,594	..	..	1,594
Do D. 109 .. ..	..	1,595	..	..	1,595
Total .. ..	13,411 $\frac{3}{4}$	15,670	4,679	240	34,000 $\frac{3}{4}$

## AGRICULTURAL DEMONSTRATION.

An Agricultural Demonstration on a large scale was held on the farm on the 21st Dai 1343 Fasli, from 8-30 a.m. onwards, when the Subedar Sahib of Aurangabad opened the show. Mr. V. R. Dharwarkar, the Deputy Director of Agriculture, Godavari Division, in an introductory speech explained in brief what the Department of Agriculture was doing for the Mahrattwada area and what the visitors were expected to see at the Demonstration. More than 5,000 people including over 2,000 cultivators who had come from villages of Parbhani, Nanded, Bir and Aurangabad districts attended the show. The officers of the Co-operative Department including the Registrar, were also present. A noteworthy feature was the presence of a number of Revenue Officers of the Mahrattwada Suba who were specially deputed for the occasion.

The show was divided into several sections such as Horticulture, Poultry, Crop-breeding, Entomology and another section on General Agriculture including the working of the Crude-oil Tractor, pumping plant and other water-lifting devices, the Chaff-cutter, Sugar cane Crusher, Gul-making, and Sugar-cane planting on modern methods.

The Taluqdar of Parbhani and other Local Officers and unofficial members of the Public greatly assisted the Agricultural Department in making the occasion a great success.

V. R. DHARWARKAR,  
*Deputy Director of Agriculture,*  
*Godavari Division, Parbhani.*

## MAIN EXPERIMENTAL FARM, PARBHANI.

The programme of research and experimental work for the year 1343-44 Fasli is as follows:—

1. Cotton rotation experiment.
2. Cotton manurial experiment.
3. Seed-rate experiment with ground-nuts.
4. Green manuring experiment with wheat.
5. Trial of paddy cultivation in black soil.
6. Comparison of cotton varieties.
7. Comparison of sugar-cane varieties.
8. Comparison of ground-nut varieties.
9. Comparison of jowar varieties.
10. Comparison of linseed varieties.
11. Comparison of gram varieties.
12. Comparison of wheat varieties.

